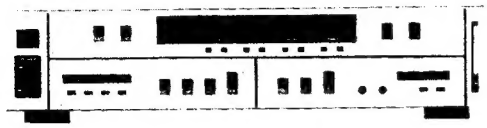
SP01055

SONY

TIME CODE GENERATOR/READER

BVG-1000



OPERATION AND MAINTENANCE MANUAL

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SECTION 1
OPERATION

1-1. FEATURES

Universal type

The model can be used with the NTSC, PAL or SECAM systems and it generates and reads out not only standard longitudinal time codes but also a vertical interval time code (VITC).

The output time code, either longitudinal or vertical interval time code, locks 2 fields (1 frame). Additional 4-field identification is required when a 4-field lock time code is required. For details, see section 1-7-2.

Vertical interval time code

Using the INT/EXT longitudinal time code, the model can add a time code into the video vertical intervals. Frame identification is possible at slow speeds, including still frame.

Accurate readout

When the SMPTE/EBU time code and VITC are combined for the model's operation, the time code can be read out accurately and simultaneously displayed from still-frame to fast forward and rewind at any tape speed (ranging from still to 128 times the normal tape speed, including forward and reverse).

Built-in character generator

The model is capable of superimposing the time code onto the monitor screen.

Code-Lock function

The model provides a code-lock (extrapolation) capability with incoming standard SMPTE/EBU time code or VITC.

Display of external user bits

Generator or reader user bits can be displayed.

Interfacing capability with computer

The DATA I/O connector can be used to interface the model with a computer. (Data 4 bit, parallel bus)

Lost power/lock memory function

The model is equipped with functions that enable momentary power cuts and sync deviations to be stored in its memory and displayed. This means that it is not necessary to continue to monitor the time code generation.

Remote control capability

The functions of the function control panel and the input and output of the digital data can all be controlled remotely.

Rack mounting

The model can be installed in a 19-inch rack conforming to EIA standards.

1-2. SPECIFICATIONS

1-2-1. Electrical

TIME CODE INPUT	0.5 to 10 Vp-p 600/3 k-ohms balanced 0.15 to 2.2 Vp-p 75 ohms unbalanced
TIME CODE OUTPUT	0 to +8 dBm (INT adj) 600 ohms balanced
VIDEO INPUT	1 Vp-p 75 ohms return loss −36 dB
VIDEO OUTPUT	1 Vp-p 75 ohms
LINEARITY	1%
DG	1%
DP	1°
K-factor	1% (2T pulse)
FREQUENCY RESPONSE	30-6 MHz ±0.2 dB
S/N	60 dBp-p signal to rms noise (100 kHz-video fg RES)
Sag	1.5%
VITC GENERATOR	
Amplitude of encoded time code	80 ± 10 IRE units
Position	Line 10–26
Bit rate	113.75fH kb/s fH→kHz
TIME CODE READOUT RANGE	
Overall readout range	Still frame to 128 times in forward and reverse In auto mode: VITC and standard SMPTE/EBU time code switched automatically (longitudinal track)
VITC readout range	Still frame to 2 times in forward and reverse
Longitudinal track readout range	1/16 to 128 times in forward and reverse
POWER REQUIREMENTS	AC 100/120/220/240 V (selectable) 48-64 Hz
POWER CONSUMPTION	100 W

1-2-2. Mechanical

CONNECTORS

Data I/O	25 p D-sub Female*
Remote	25 p D-sub Male*

Generator section

time code out	3 p XLR
time code in	3 p XLR
sync in	BNC x2 loop-through W/75 ohms ON/OFF
video out W/VITC	BNC
video in	BNC } loop-through W/75 ohms
return	BNC } ON/OFF

Recorder section

time code out	3 p XLR
time code in	3 p XLR
video out W/VITC	BNC
video out W/character	BNC
video in	BNC } loop-through W/75 ohms
return	BNC } ON/OFF

DIMENSIONS	424 (W) x 88 (H) x 446 (D) mm
WEIGHT	Approx. 13 kg (28.6 lbs.)

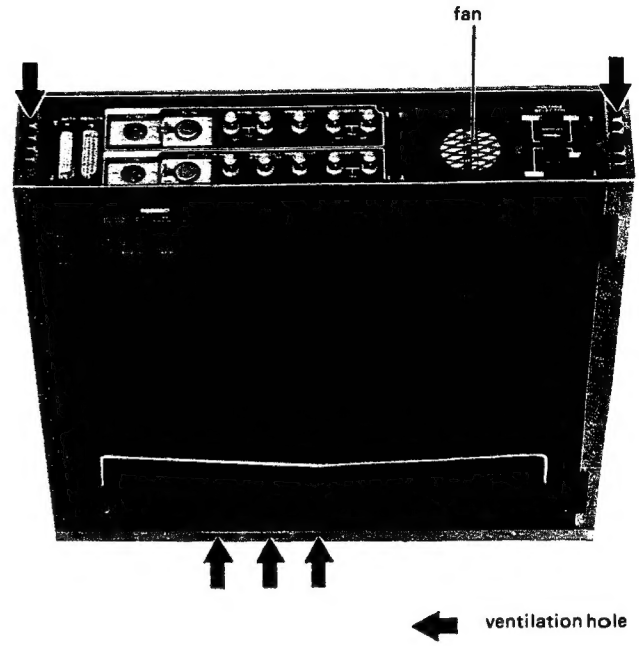
ACCESSORIES

Remote indicator	1 set
Rack mount bracket	1 set
Fuse	1
Cover	1
Extension board	1

* The DATA I/O and REMOTE connectors are the D-type or D-sub type. For a connecting plug mating with these connectors, please consult a connector manufacturer. The model numbers of the mating plugs are the following:
for DATA I/O connector: D-25-P with shell ass'y
for REMOTE connector: D-25-S with shell ass'y
The lock screws of the BVG-1000 have a metric screw thread (3 mm diameter in earlier models and 2.6 mm in the present model). If the lock screws of your plug have an inch screw thread, replace the lock screws of the BVG-1000 with ones which have an appropriate inch thread.

1-3. PRECAUTIONS BEFORE USE

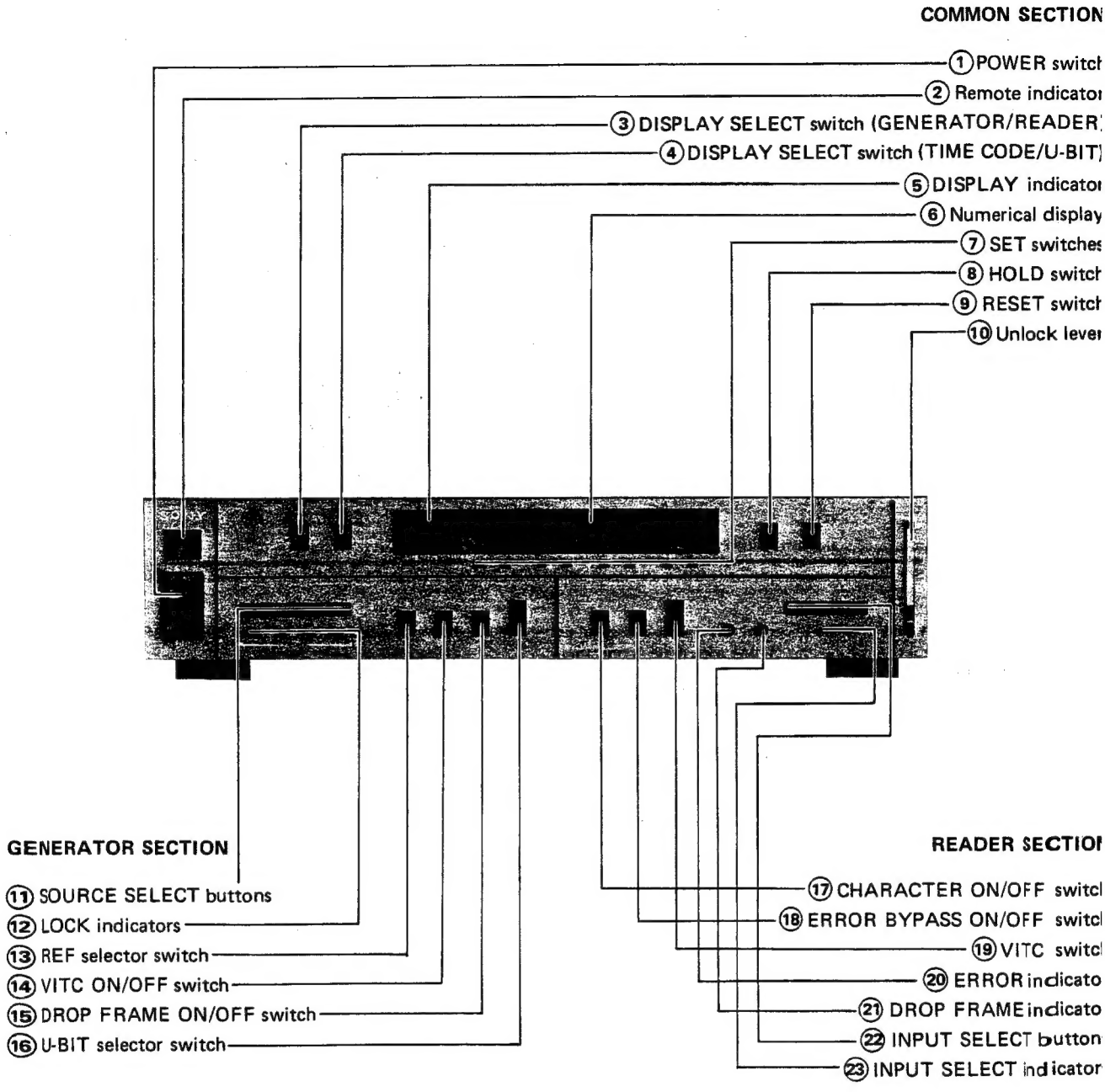
- Make sure that you use the model in ambient temperatures which do not exceed a 0°C to 40°C range.
- Avoid using the model near any source of heat.
- Do not block either the fan or the ventilation holes (see figure below).



- Leave a clearance of at least 30 cm between the rear panel and a wall or other surface.
- Always close the function control panel after internal adjustments.
- Allow the model to warm up for about 15 minutes before actual use.

1-4. DESCRIPTION OF PARTS AND CONTROLS

1-4-1. Function control panel



COMMON SECTION

① **POWER switch**

② **Remote control indicator**
This lights up when the model is being controlled remotely.

③ **DISPLAY SELECT switch (GENERATOR/READER)**
GENERATOR: The GENERATOR of the DISPLAY indicator lights up to indicate that a generator output is being displayed.
READER: The READER of the DISPLAY indicator lights up to indicate that a reader input is being displayed.

④ **DISPLAY SELECT switch (TIME CODE/U-BIT)**
TIME CODE: The diplay contents are set to the time code.
U-BIT: The display contents are set to the user bits.

⑤ **DISPLAY indicator**
This is divided into two parts: one indicates that the generator output is being displayed and the other indicates that the reader input is being displayed.

⑥ **Numerical display**
This displays the time code or user bits in eight digits.
The field (odd or even) is also displayed with time code indication.
- The field marking is displayed by LED for the rightmost digit for reader indication only, irrespective of the GENERATOR/READER selector switch position.
- The following symbols are displayed for the user bits when the data are based on hexadecimal notation ranging from A to F:
  A →⊏ , B → ⊐, C →⊔ , D →⊑ , E →⊏ , F → no display

⑦ **SET switches**
These are used to set the initial value of the generator output's time code or the specified digits of the user bits. Before setting, set the numerical display to GENERATOR indication and then select/hold the time code or user bits.

⑧ **HOLD switch**
This is used to hold the generator or reader.
When this switch is set, a point appears on the left under each numerical display digit. (These points light up.)
This switch can be used in conjunction with the momentary switch to repeat hold operation and to release hold operation. If the generator (or reader) is held and the numerical display is switched over to reader (or generator), the generator (or reader) hold function is released.

⑨ **RESET switch (momentary switch)**
When the generator is being held, all the digits are reset to zero if this switch is depressed.

⑩ **Unlock lever**
Push the bottom of the lever, tilt it and pull out in front. It is then possible to open the function control panel out toward the left.

GENERATOR SECTION

⑪ **SOURCE SELECT buttons**
These buttons are used to select the source on which the generator's time code is based.
REF: When the generator's hold function is released, the video signal or sync signal connected to the ⑧ VIDEO IN or ⑤ SYNC IN connectors of the connector panel is referenced and advanced.
EXT CODE: This button makes available the time code connected to the ④ TIME CODE IN connector on the connector panel as a referenced and sampled output.
READER: This button makes available the VITC (signal selected by the INPUT SELECT buttons) or time code connected to the ⑩ TIME CODE IN connectors on the connector panel as a referenced and sampled output.
- Under normal operating conditions, it is necessary to synchronize the time code or VITC input signals and the reference signals.

LINE: When the generator hold function is released, the AC line frequency is referenced and advanced.
- Different line frequencies (50 or 60 Hz) are automatically detected, and the SMPTE or EBU time code is generated.
- The AC line frequency is automatically locked to when there are no reference signals supplied.

⑫ **LOCK indicators**
When the generator's phase lock loop (PLL) circuit locks to the signals selected by the SOURCE SELECT buttons, the corresponding LED indicator lights up.

⑬ **REF selector switch**
VIDEO: When the REF SOURCE SELECT button is depressed, video signals are made available as the reference signals.
SYNC: When the REF SOURCE SELECT button is depressed, sync signals are made available as the reference signals.
- When this switch is kept at SYNC, the time code or the user bits will remain stable even if the off tape video signals connected to the ⑩ TIME CODE IN connectors on the connector panel are out of sync when the reader's character generator is used and the time code or user bits are superimposed onto the monitor screen.
  (This means that the time code or user bits will remain stable at the same location on the monitor screen.)

⑭ **VITC ON/OFF switch**
ON: When the ⑬ REF selector switch is set to VIDEO, the VITC is added to the video signals connected to the generator.
OFF: The VITC is set to OFF.
- When the ⑬ REF selector switch is set to SYNC, the VITC position is based on SYNC.
- Under normal operating conditions, the video and sync signals should be locked.
- When the LINE SOURCE SELECT button has been depressed, the time code will be subjected to an abnormal operation whereby the value sampled by the line is added to the VITC.

⑮ **DROP FRAME ON/OFF switch**

ON: The model is set to the drop frame mode when the SMPTE time code and the VITC are generated for NTSC signals.

OFF: No drop frame operation.

With an EBU time code, the switch may be set to ON or OFF since there is no change. However, the SECAM/PAL/NTSC switch on the VIDEO PC board must be set to either the SECAM or the PAL position.

⑯ **U-BIT selector switch**

THRU: When the READER or EXT CODE SOURCE SELECT button is depressed, the reader data are made available as the user bits.
With direct input to the bus of the ① DATA I/O connector on the connector panel, the data are made available as the user bits.
- When there is no input from the reader and DATA I/O connector, the user bits are generated by the generator.

INT: User bits are generated by the generator.

EXT: User bits are generated via input from the ① DATA I/O connector on the connector panel.
When there is no input at the DATA I/O connector, the user bits are generated by the data at the reader side.
- When there is no reader or DATA I/O connector input, user bits are generated by the generator.

READER SECTION

⑰ **CHARACTER ON/OFF switch**

ON: Using the character generator, the time code or user bits can be superimposed on the video signals connected to the reader. While the time code or user bits are being read out by the reader, the superimposition can be viewed on the monitor screen.
- If the ⑬ REF selector switch is set to SYNC with a sync input, the superimposed characters will remain stable even if the off tape video tape speed fluctuates.
- The following symbols are displayed for the user bits when the data are based on hexadecimal notation ranging from A to F.
A → :, B → ;, C → <, D → =, E → >, F → ?

⑱ **ERROR BYPASS ON/OFF switch**

ON: The error bypass circuit is activated.
The length of the error bypass can be selected up to a maximum of 15 frames using the switch on the printed circuit board.

OFF: The error bypass circuit is disabled.

⑲ **VITC switch**

THRU: The video signals connected to the reader are fed out unprocessed, without the VITC information added.

ON: Set the switch to this position to add the VITC to the video signals or to replace previously added VITC with a new value.
When the VITC is added to the video signals connected to the reader, the time code read out by the reader is encoded into the VITC and added.
- Previously added VITC can be replaced with a new value when the position of the previous VITC (the 3 lines in the vertical interval occupied by coding) and the position of the new VITC are identical.

The 3 lines to be occupied by the VITC insertion can be selected using the switch on the printed circuit board.
(It is recommended that the VITC information be inserted into the active periods of lines 12, 13 and 14 for each field with the NTSC system.)

OFF: Set the switch to this position when not inserting or when taking out the VITC signals.
- As noted in the description for the ON position, the VITC positions should be identical when removing old VITC.

⑳ **ERROR indicator**

This lights up to indicate that a time code error has been detected during readout. This indicator comes on regardless of the position of the ERROR BYPASS ON/OFF switch. The display will indicate the correct value within the limit of the error bypass (when the ERROR BYPASS ON/OFF switch is set to ON).

㉑ **DROP FRAME indicator**

This lights up when the time code is set to the drop frame mode when the SMPTE time code and VITC are being read out with respect to the NTSC signals.

㉒ **INPUT SELECT buttons**

AUTO: The SMPTE/EBU time code is read out automatically when the tape is traveling at more than half the normal playback speed.
The VITC is read out when the tape is traveling at less than half the normal playback speed.

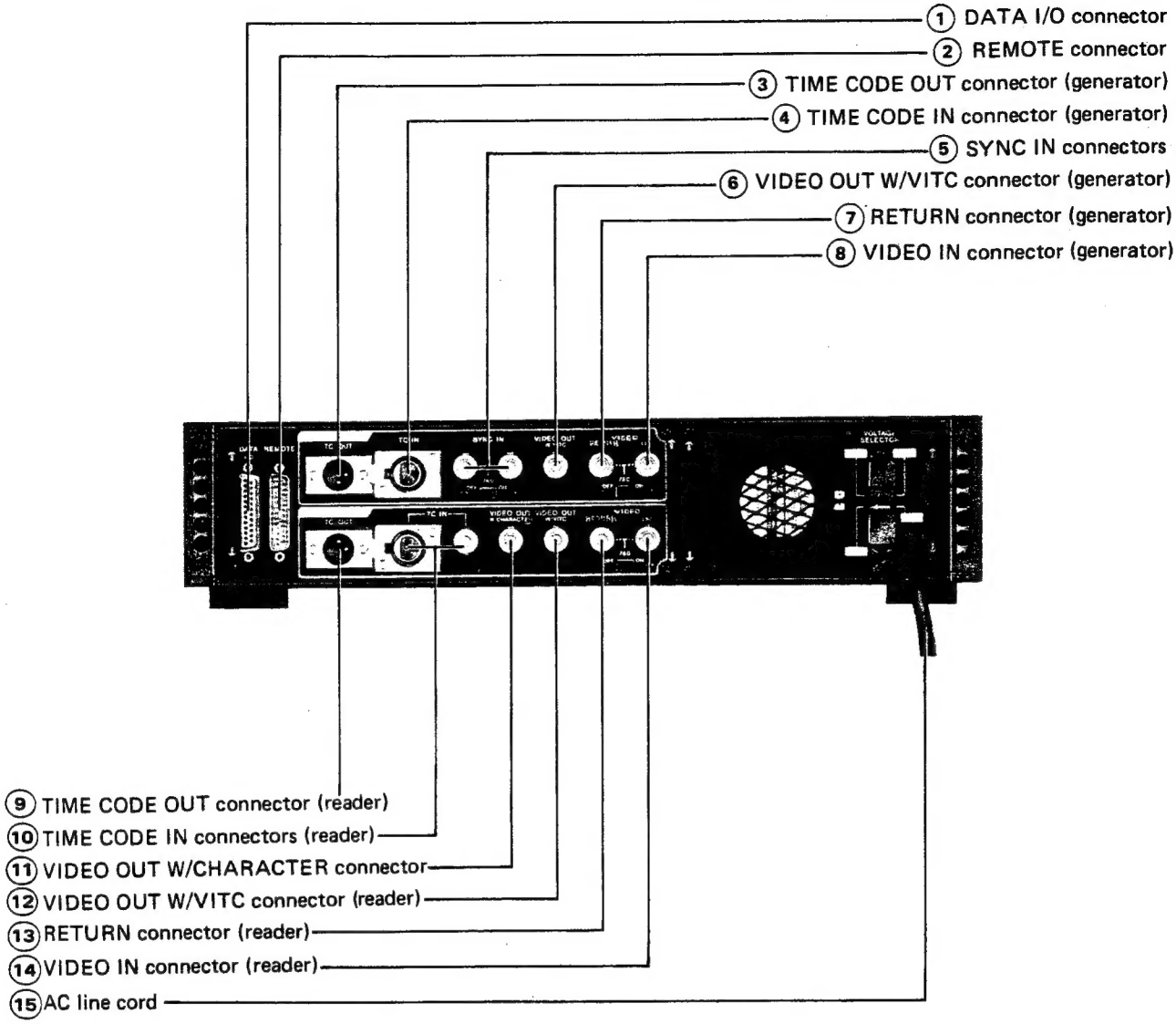
TC: Depress this button to read out the SMPTE/EBU time code when the tape is traveling at 1/16 to 128 times of the normal playback speed.

VITC: Depress this button to read out the VITC when the tape is traveling at 0 to double of the normal playback speed.

㉓ **INPUT SELECT indicators**

When the AUTO INPUT SELECT button is depressed, the TC or VITC indicator under the INPUT SELECT buttons lights up to indicate the type of time code being read out by the reader.

1-4-2. Connector panel



① **DATA I/O connector**
Input/output connector for generator/reader data and timing signals.
Data 4-bit parallel bus (for further details, refer to the material given later on)

② **REMOTE connector**
This is used to allow the functions of the function control panel to be controlled remotely.

③ **TIME CODE OUT connector (generator)**
Load impedance: 600 ohms
Output connector for longitudinal time code generated by the generator.

④ **TIME CODE IN connector (generator)**
Input impedance: 600/3 k-ohms (can be selected at printed circuit board)
Input connector for locking model's generator to incoming SMPTE/EBU time code.
Input time code should have a same bit rate as that of the normal playback.

⑤ **SYNC IN connectors**
External sync input connectors, bridge output, termination resistance ON/OFF
By operating the controls on the function control panel and setting the model to external sync lock, the generator's time code and the reader's character generating circuitry are minimally affected by noise.

⑥ **VIDEO OUT W/VITC connector (generator)**
This outputs the video signal from the ⑧ VIDEO IN connector to which the generated VITC is added.
When the incoming signal carries a VITC, this connector also outputs a signal whose VITC has been replaced by a new VITC from the generator. In this case, the ⑥ POSITION and the ⑦ WIDTH switches on the printed circuit board should be set to cover the lines on which the incoming video signal carries the VITC.

⑦ **RETURN connector (generator)**

⑧ **VIDEO IN connector (generator)**
To be bridge-connected with the ⑦ RETURN connector, termination resistance ON/OFF
Video signals connected to these connectors serve as the generator's reference.
Connect the video signals to these connectors when it is desired to add the VITC to these signals. Feed the signals out from the ⑥ VIDEO OUT W/VITC connector.

⑨ **TIME CODE OUT connector (reader)**
Load impedance: 600 ohms
This outputs the longitudinal time code which is regenerated from either the SMPTE/EBU time code fed from the ④ TIME CODE IN connector or the VITC fed from the ⑧ VIDEO IN connector.
The regeneration function can be selected by the printed circuit board switch as follows.
a) The time code read out by the reader is replaced by the normal playback bit rate and fed out. (The timing is exactly the same as that for the generator.)
b) The input time code waveforms are shaped and fed out.

⑩ **TIME CODE IN connectors (reader)**
600/3 k-ohms (can be selected at printed circuit board), balanced
75 ohms, unbalanced
Two input connectors (balanced and unbalanced) are provided but they cannot be used simultaneously.
The unbalanced input has a broader band width than the balanced input.

⑪ **VIDEO OUT W/CHARACTER connector**
This outputs the same signal as the output of the ⑫ VIDEO OUT W/VITC connector, with characters of the read time code superimposed on the picture. Normally, the output signals from this connector are used for monitoring but they may also be used for off line editing copy.
The characters will be "burned" into the picture when the signal is recorded. (Position, width, height are internally selectable.)
Noise may be observed around the characters with SECAM signals and so these are only used for monitoring.

⑫ **VIDEO OUT W/VITC connector (reader)**
This outputs the video signal from the ⑭ VIDEO IN connector with the VITC which is encoded from the SMPTE/EBU time code read by the reader.
When the incoming signal carries a VITC, this connector also outputs the signal whose VITC has been replaced. In this case, the ⑥ POSITION and the ⑦ WIDTH switches on the printed circuit board should be set to cover the lines on which the incoming video signal carries the VITC.

⑬ **RETURN connector (reader)**

⑭ **VIDEO IN connector (reader)**
To be bridge-connected with the ⑬ RETURN connector, termination resistance ON/OFF
Input connectors for video signals from a VTR or similar equipment.
The VITC in the video signals can be read out by the reader.
The video input signals are made available at the ⑪ VIDEO OUT W/CHARACTER and ⑫ VIDEO OUT W/VITC connectors.

1-4-3. Connection precautions

The ⑦ (⑬) RETURN and ⑧ (⑭) VIDEO IN connectors as well as the ⑤ SYNC IN connectors are configured as loop-through connections and they can be bridge-connected.

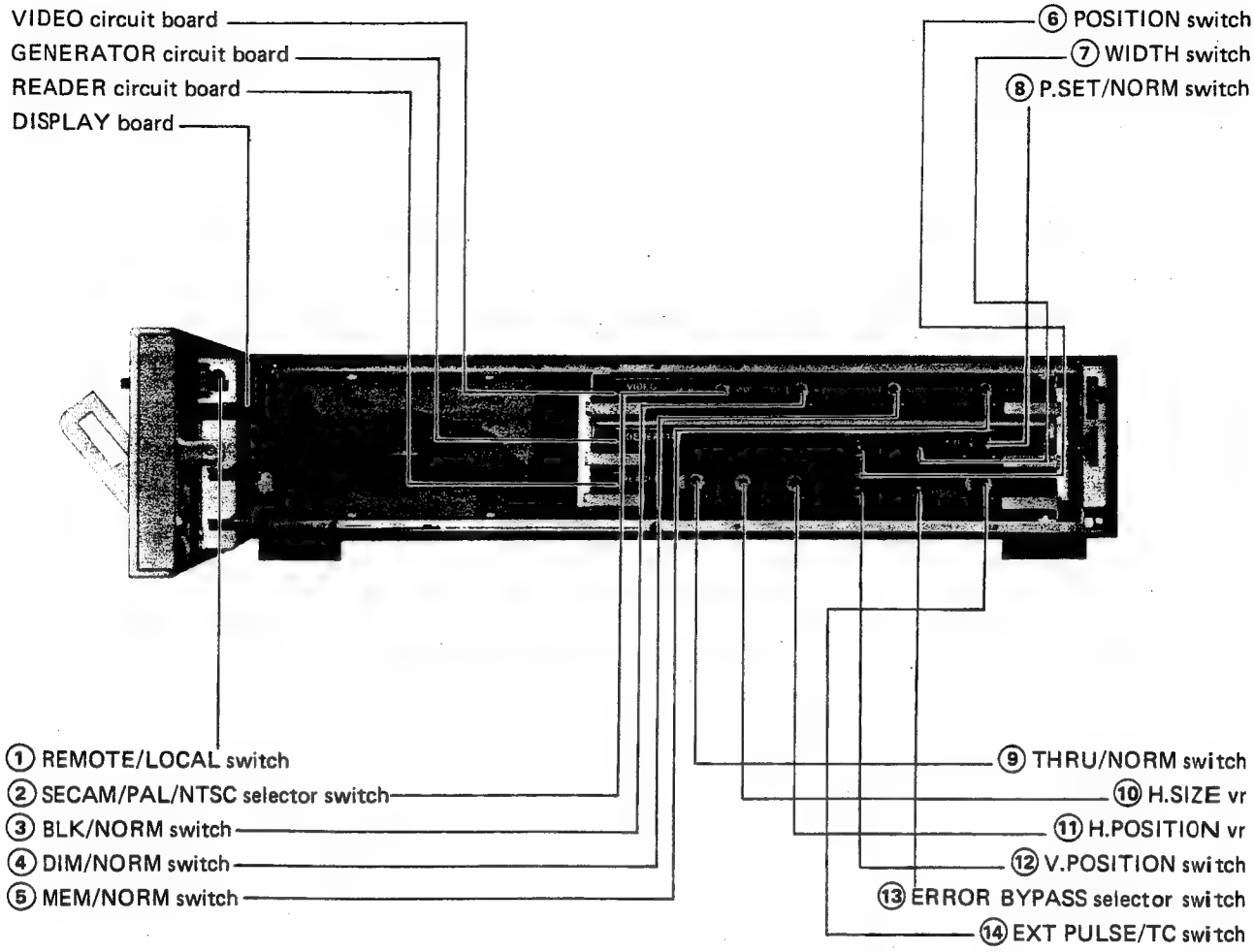
Therefore, always check the on/off positions of the connectors' 75-ohm termination resistors.

This model is designed so that when the power is off the signals from the ⑥ and ⑫ VIDEO OUT W/VITC connectors are not cut off, so bear in mind the following points for the connections including the above-mentioned bridge connections.

- **When the power is switched off with the termination resistors of the RETURN and VIDEO IN connectors at ON:**
The VIDEO IN connector is connected to both the RETURN and VIDEO OUT connectors; at the same time the internal circuitry, including the termination resistors, is cut off. Therefore, the signal source which has been connected to the VIDEO IN connector is terminated by the load which has been connected to the VIDEO OUT connectors.

- **When the power is switched off with the termination resistors of the RETURN and VIDEO IN connectors at OFF:**
The VIDEO IN connector is connected to the VIDEO OUT connectors; at the same time, the internal circuitry, including the RETURN and the termination resistors, is cut off.
Therefore, the signal source which has been connected to the VIDEO IN connector is terminated by the load which has been connected to the VIDEO OUT connectors.

1-4-4. Printed circuit board



- All the slide switches are set to their righthand positions for normal operation.

DISPLAY board

① **REMOTE/LOCAL switch**

REMOTE: Set the switch to its top position.
The remote control indicator on the function control panel lights up and the controls on the function control panel no longer function.

LOCAL: The model can be operated normally with the controls on the function control panel.

VIDEO circuit board

② **SECAM/PAL/NTSC selector switch**

SECAM: Set here for SECAM video signals.
PAL: Set here for PAL video signals.
NTSC: Set here for NTSC video signals.

③ **BLK/NORM switch**

BLK: The video signals entering the generator can be transformed into black burst and fed out.
Color is added when SECAM signals are supplied.

NORM: Position for normal operation (righthand setting)

④ **DIM/NORM switch**

DIM: The brightness of the first two digits (10H, H) of the numerical display as well as the last two digits (10F, F) can be reduced.

NORM: Position for normal operation (righthand setting)

⑤ **MEM/NORM switch**

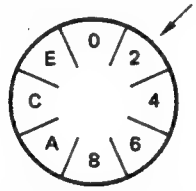
MEM: The power is momentarily cut off and the sync disturbances are memorized.
Lost lock → The LOCK indicators blink.
Lost power→ The LOCK indicators and numerical display blink.
Set the switch to NORM to reset the blink indication. Set the POWER switch to ON and then set this switch to MEM to actuate the lost lock and lost power functions.

NORM: Position for normal operation (righthand setting) and to reset as explained above.

GENERATOR circuit board

⑥ **Position switch**

Use this switch to determine in which line the VITC signal is to be inserted. (Common to generator/reader)
Keep this switch at '2' for NTSC signals.
2 : line 12



⑦ **WIDTH switch**

This switch is used to determine how many lines should be spanned with the VITC signal. (Common to generator/reader)
Keep this switch at '3' for NTSC signals.

⑧ **P.SET/NORM switch**

P.SET: If this switch is kept at this position for SMPTE/EBU time code assembly (code-lock), connections can be made with the magnetic pattern level on the tape. For compensation, bit 63 (highest user bit) is used as the parity bit.

NORM: The switch is usually kept to this position (righthand setting) to allow all the user bits to be used freely.

READER circuit board

⑨ **THRU/NORM switch**

THRU: The waveforms of the time code signals entered into the reader are shaped and fed out.
The output signal bit rate changes according to the input signal.

NORM: The normal playback time code entered into the reader is regenerated, shaped and fed out at the same timing as that of the generator. There is no deterioration in the waveforms when the output signals are used during dubbing.
(in normal playback mode.)

⑩ **H.SIZE vr**

This is used to adjust the horizontal size of the characters which are superimposed by the reader.

⑪ **H.POSITION vr**

This is used to adjust the horizontal position of the characters which are superimposed by the reader.

⑫ **V.POSITION switch**

This is used to adjust the vertical position of the characters which are superimposed by the reader.

⑬ **ERROR BYPASS selector switch**

This is used to select the length of the error bypass required, between 1 and 15 frames.
The correct values are displayed on the numerical display when the length of the time code is shorter than the error bypass length even if the time code entered into the reader is erroneous.
However, when a time code with a discontinuous value has been entered, jumping will take place, and the detection of the jump point will be delayed for a time corresponding to the error bypass length.
This means that better results can be obtained by shortening the error bypass length beforehand when the time code to be entered has a high quality.
This switch is normally kept at ON.

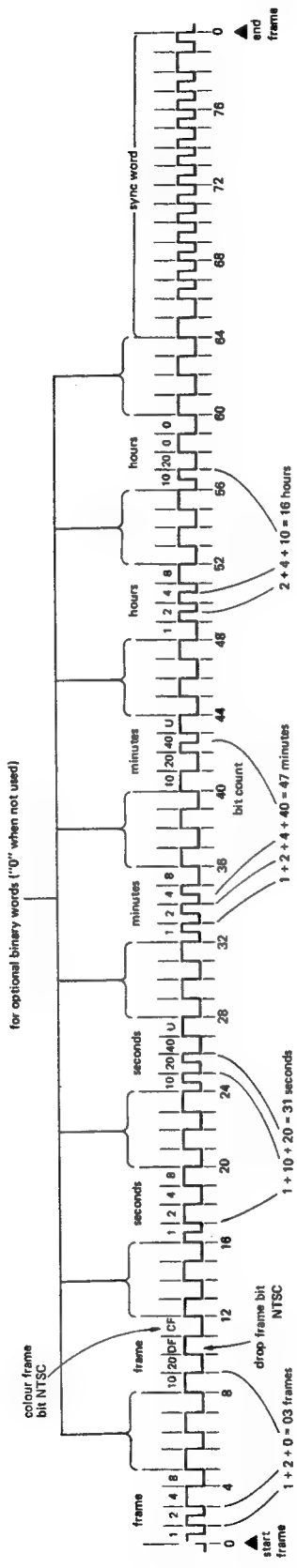
⑭ **EXT PULSE/TC switch**

EXT PULSE: When the tape speed of the VTR is slow, the VITC is read out, and when it is fast, the external (frame) pulses are read out, e.g. externally inserted time code signals using CTL pulses.
In this case, the VITC should be continuous. The ⑱ ERROR BYPASS ON/OFF switch on the Function control panel should be set to ON.

TC: Position for normal operation (righthand setting)

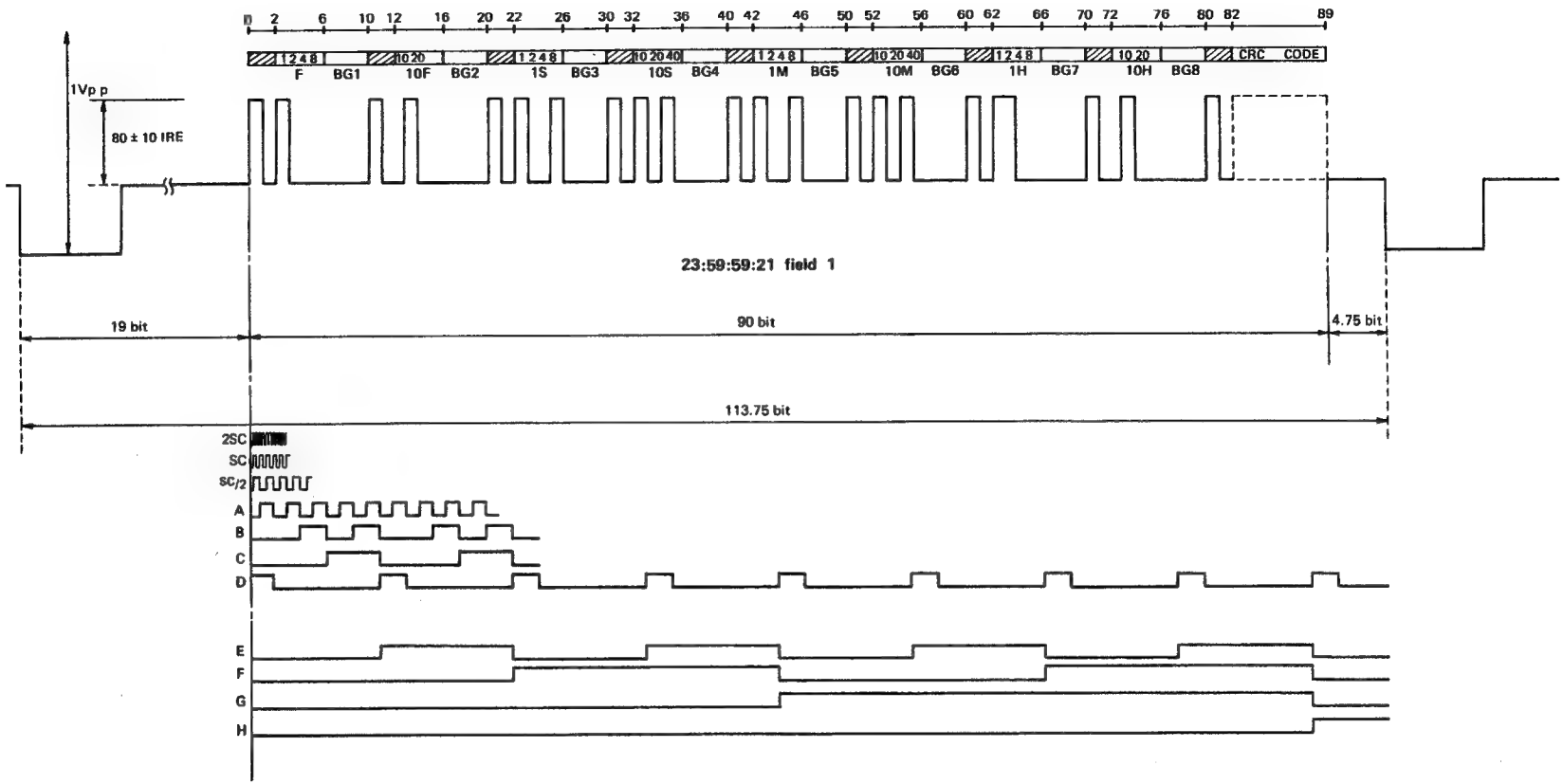
1-5. WAVEFORM

1-5-1. Standard SMPTE/EBU time code (1 frame)



"0" = ⊓,⊔

"1" = ⊓,⊓



BG1 BG8 ---binary group (User bit)

0–1	synchronizing bits	0 fixed one 1 fixed zero
2–5	units of frames	
6–9	first binary group	(BG1)
10–11	synchronizing bits	10 fixed one 11 fixed zero
12–13	tens of frames	
14	drop frame flag *1	
15	colour frame flag *2	
16–19	second binary group	(BG2)
20–21	synchronizing bits	20 fixed one 21 fixed zero
22–25	units of seconds	
26–29	third binary group	(BG3)
30–31	synchronizing bits	30 fixed one 31 fixed zero
32–34	tens of seconds	
35	field mark	1.3(5.7) *3 field. . .zero 2.4(6.8) field. . .one
36–39	fourth binary group	(BG4)
40–41	synchronizing bits	40 fixed one 41 fixed zero
42–45	units of minutes	
46–49	fifth binary group	(BG5)
50–51	synchronizing bits	50 fixed one 51 fixed one
52–54	tens of minutes	
55	unassigned bit	(zero until specified)
56–59	sixth binary group	(BG6)
60–61	synchronizing bits	60 fixed one 61 fixed zero
62–65	units of hours	
66–69	seventh binary group	(BG7)
70–71	synchronizing bits	70 fixed one 71 fixed zero
72–73	tens of hours	
74–75	unassigned bits	(zero until specified)
76–79	eighth binary group	(BG8)
80–81	synchronizing bits	80 fixed one 81 fixed zero
82–89	CRC CODE (cyclic redundancy check code)	

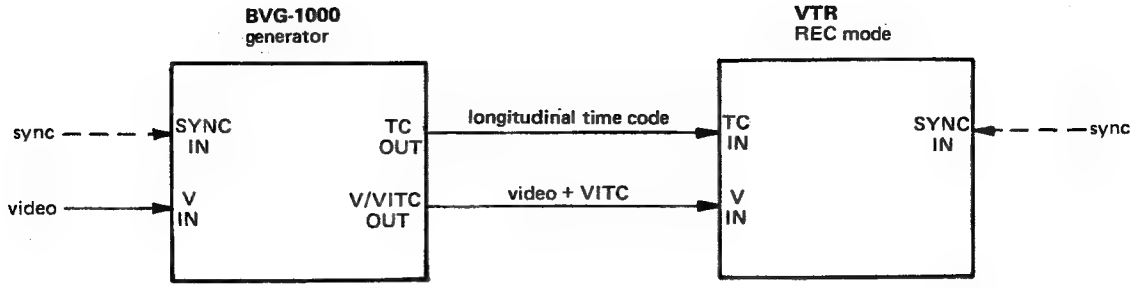
*1 "0" except with NTSC

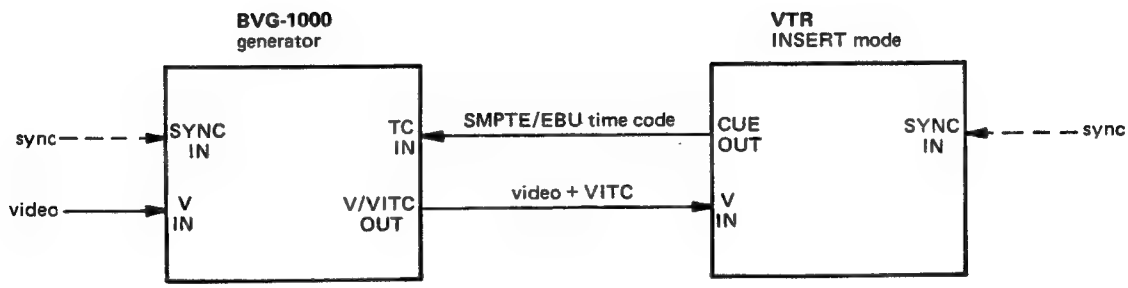
*2 NTSC only

*3 values in the parentheses: PAL only

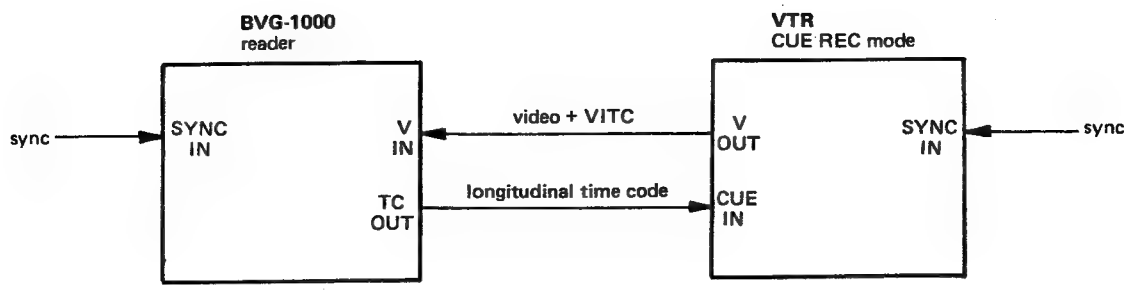
1-6. CONNECTIONS (variations)

GENERATOR

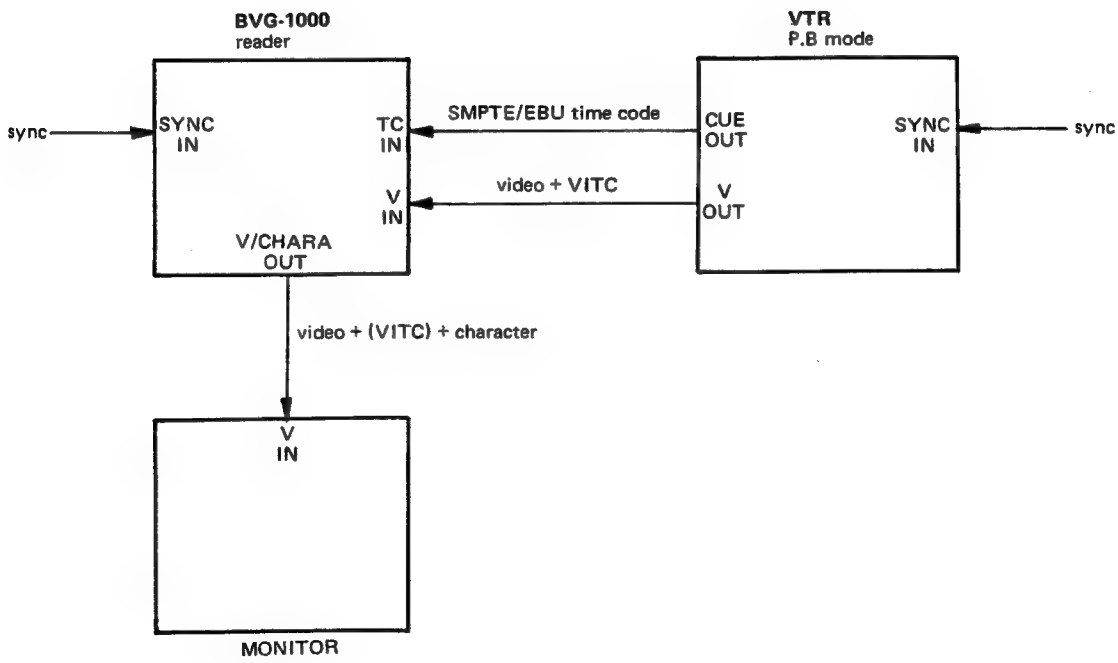




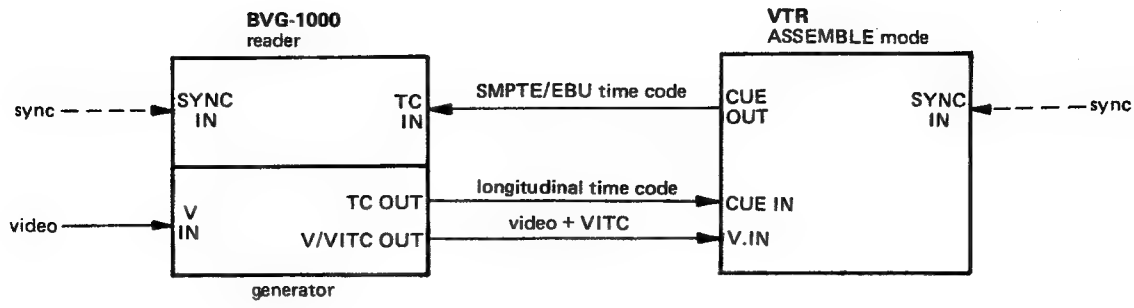
READER (GENERATOR)



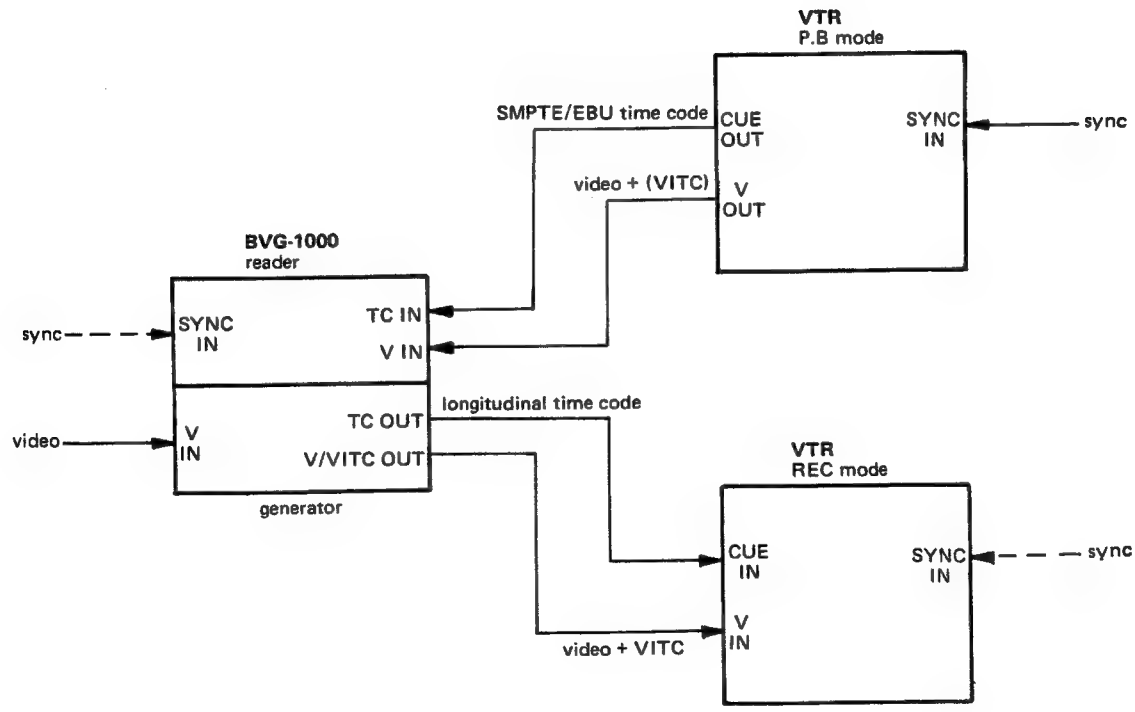
READER



GENERATOR/READER (code-lock)



GENERATOR/READER (two VTRs)



1-7. DIGITAL CONTROL INTERFACE

By using a simple interface with a TTL level, this model can be coupled to other equipment (video equipment, editor, etc). Forty signals are available from the motherboard and these are divided among the DATA I/O connectors and REMOTE connectors on the connector panel.

The following signals are available at the DATA I/O connectors:

Reader and generator data out (TIME or U-BIT) signal
Data in (TIME or U-BIT) signal to generator
Generator color frame sync (time code aligned at 15 Hz or 12.5 Hz) signal
Generator code switching signal and DF mode out signal
Reader field out signal
Reader forward/reverse out signal

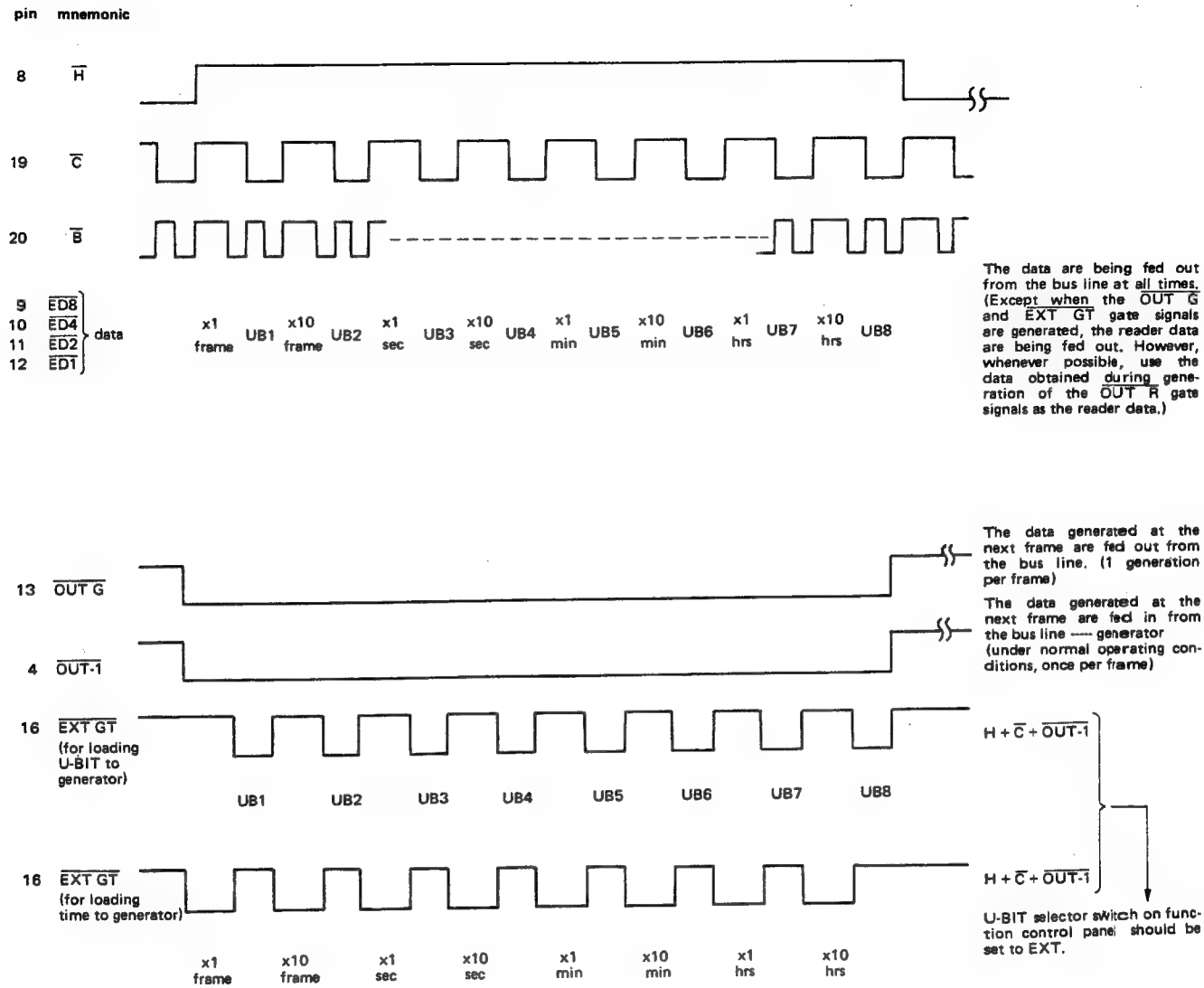
All the function signals of the function control panel are available at the REMOTE connectors.

1-7-1. Names of DATA I/O connector signals

Pin	Mnemonic	I/O	Description
1			
2	GND		
3	GDF	out	Generator drop frame mode signal (Always "L" level with EBU time code)
4	$\overline{\text{OUT 1}}$	out	Generator data incoming gate signal
5	$\overline{\text{FIELD}}$	out	Reader field signal
6	FWD	out	Reader forward/reverse signal
7	$\overline{\text{TMDL}}$	out	Reader time code/VITC switching signal
8	$\overline{\text{H}}$	out	Generator timing signal
9	$\overline{\text{ED8}}$	in out	Data bus line signals
10	$\overline{\text{ED4}}$	in out	
11	$\overline{\text{ED2}}$	in out	
12	$\overline{\text{ED1}}$	in out	
13	$\overline{\text{OUT G}}$	out	Bus line data must be generator signal
14	LA/4	out	Generator timing signal
15	$\overline{\text{LG}}$	out	Generator timing signal
16	$\overline{\text{EXT GT}}$	in	Bus line data must be external signal
17	$\overline{\text{EXT}}$	out	Generator U-BIT must be external mode
18	$\overline{\text{OUT R}}$	out	Bus line data must be reader signal
19	$\overline{\text{C}}$	out	Generator timing signal
20	$\overline{\text{B}}$	out	Generator timing signal
21	MAT	in	Signal (15 Hz or 12.5 Hz) that color frame locks generator
22	$\overline{\text{FRM}}$	in	Reader external count signal
23	$\overline{\text{FD}}$	in	Reader external count is forward or reverse signal
24	+5V		DC +5 V (300 mA)
25			

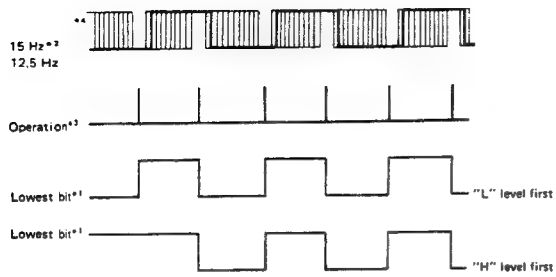
1-7-2. Phase of signals

Use the following signals for GENERATOR and data I/O operations.



- **Color frame lock signal fed into pin 21 MAT**

When the generator operations overlap when the color frame lock input signal is at "L" level (this is not the case when data are loaded from the bus line), there is no operation when the lowest bit*1 is at "H" level among the time code x1 frame data.
This can be represented graphically as follows.

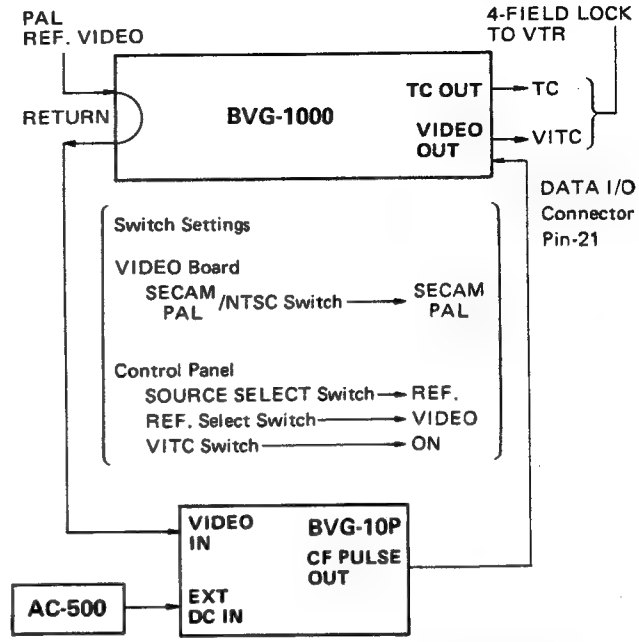


*2 A minimum of more than 1 msec is required before the operation with "L" level.
*3 The operation signal is generated within a maximum of 0.3 msec from the decay of the pin 15 $\overline{LG}$.
*4 Either the "H" level or the "L" level is acceptable for the polarity.

In the case of EBU signals, x1 sec is as in the figure with 0, 2, 4, 6, 8 but the polarity of the *1 lowest bit is reversed with 1, 3, 5, 7, 9.

- **Application of a 4-field lock**

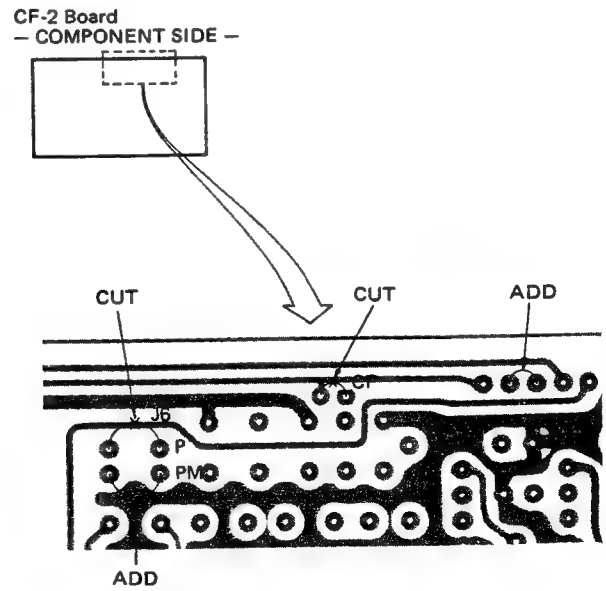
When performing the 4-FIELD lock operation using the BVG-10P (optional), it is necessary to modify the BVG-10P on board CF-2 as follows.



Note: The BVG-10P is equipped with two CF PULSE output connectors on the connector panel. A 4-Field pulse is obtained from the right CF PULSE output connector.

1) Remove the four screws holding the rubber feet, then slide the cover of the connector panel and remove it.

2) Perform the following modifications on the CF-2 board.



3) Refit the cover.

Use the following signals for READER and data I/O operations.

When reading out time code and U-BIT data

Pin	Mnemonic	
8	$\overline{H}$	
19	$\overline{C}$	Same as page . . . 19
20	$\overline{B}$	Same as page . . . 19
9	$\overline{ED8}$	data Same as page . . . 19
10	$\overline{ED4}$	
11	$\overline{ED2}$	
12	$\overline{ED1}$	
18	$\overline{OUT\ R}$	

$\overline{OUT\ R}$ denotes that the bus line data are the reader data with "L" level.

READER data except those above

Pin	Mnemonic	
5	$\overline{FIELD}$	"H" level: 1st field; "L" level: 2nd field
6	FWD	"H" level: FWD; "L" level: REW
7	$\overline{TMDL}$	"H" level: VITC being read out; "L" level: all others

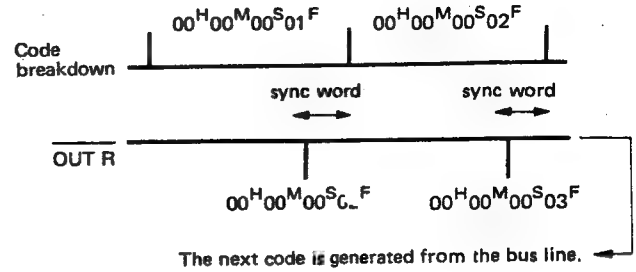
Input signal to READER

Pin	Mnemonic	
22	$\overline{FRM}$	CTL count pulse input (50% duty)
23	$\overline{FD}$	Input connector whereby pin 22 CTL count pulse is counted down at "H" level and counted up at "L" level.

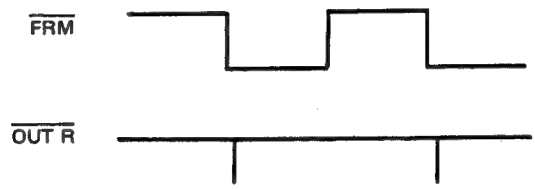
This can be used in the following cases:
When using reader with VITC only
When using reader as CTL counter
When using reader as an up/down counter

The READER data out and $\overline{OUT\ R}$ signals are generated from the bus line with the following timing.

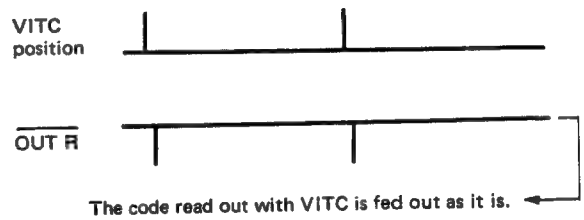
When reading the cue time code



When counting the CTL



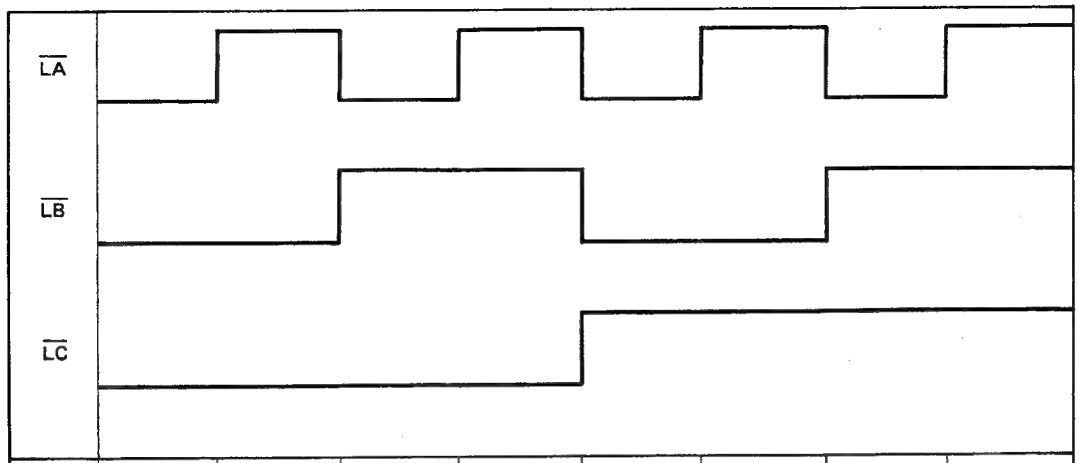
When reading out the VITC



1-7-3. Names of REMOTE connector signals

Pin	Mnemonic	I/O	Description
1			
2			
3			
4			
5			
6			
7			
8			
9	RMC	in out	Function control panel REMOCON switching signal
10	+5V		DC +5V
11	$\overline{\text{SW 1}}$	in out	Function control panel switch mode signals
12	$\overline{\text{PTT}}$	in out	
13	$\overline{\text{SW 3}}$	in out	
14	$\overline{\text{SW 2}}$	in out	
15	$\overline{\text{DS-2}}$	out	Function control panel display data signals
16	$\overline{\text{DS-1}}$	out	
17	$\overline{\text{DS-8}}$	out	
18	$\overline{\text{DS-4}}$	out	
19	$\overline{\text{LB}}$	out	Generator timing signals
20	$\overline{\text{LA}}$	out	
21	$\overline{\text{LAMP-1}}$	out	Function control panel lamp signal
22	$\overline{\text{LC}}$	out	Generator timing signal
23	GND		
24	$\overline{\text{LAMP-2}}$	out	Function control panel lamp signal
25	GND		

1-7-4. Switches and signals of function control panel



	Position	7	6	5	4	3	2	1	0	
	DS 1 DS 2 DS 4 DS8	x10 hrs (UB-8)	x1 hrs (UB-7)	x10 min (UB-6)	x1 min (UB-5)	x10 sec (UB-4)	x1 sec (UB-3)	x10 FRAME (UB-2)	x1 FRAME (UB-1)	Parentheses indicate U-BIT display
H level L	LAMP1 "Lights"				D4 REF	D7 LINE	D6 READER		D5 EXT CODE	
H L	LAMP2 "Lights"	D11 VITC	D10 TC	D8 ERROR			D12 FIELD	D9 DROP FRAME		
H L *1	PTT SET	SW27 x10 hrs (UB-8)	SW26 x1 hrs (UB-7)	SW25 x10 min (UB-6)	SW24 x1 min (UB-5)	SW23 x10 sec (UB-4)	SW22 x1 sec (UB-3)	SW21 x10 FRAME (UB-2)	SW20 x1 FRAME (UB-1)	Parentheses indicate U-BIT HOLD display
H L	SW1		RUN READER HOLD			AUTO TC	VITC	ON ERROR BYPASS OFF	ON CHAR- ACTER OFF	
H L	SW2		READER IN GENERATOR	ON READER THRU	VITC OFF	ON GENERATOR VITC OFF	VIDEO REF SYNC	SOURCE READER	SELECT REF	
H L	SW3		RUN GENERATOR HOLD	NORMAL RESET	GENERATOR DISP READER	TIME DISP U-BIT	INT U-BIT THRU	EXT	ON DROP FRAME OFF	

Approach to chart

When specified timing generated by LA, LB and LC give positions 7 to 0:

Example 1: When position 6 is at "L" level with SW 1 terminal, it denotes reader hold.

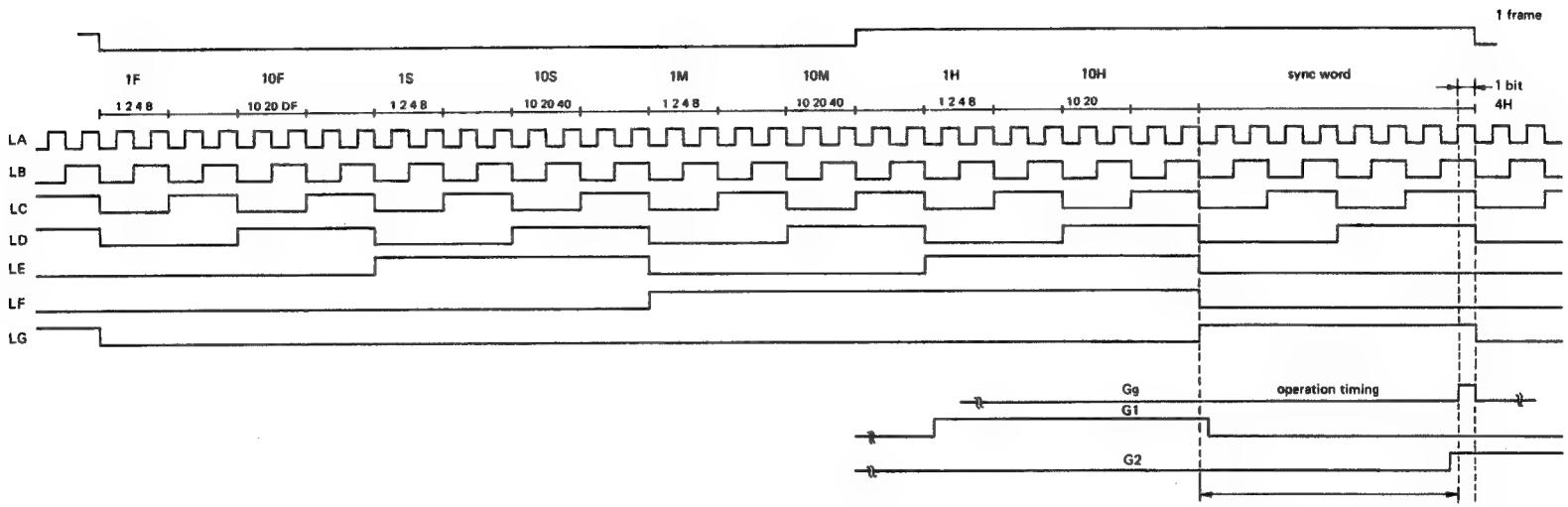
Example 2: When positions 5 and 4 are both at "H" level with SW 2 terminal, it means that the reader VITC is ON.

*1 L level : SET

1-7-5. Precautions when using DATA I/O and REMOTE connectors

Bear in mind the following when conducting data I/O operations using these terminals.

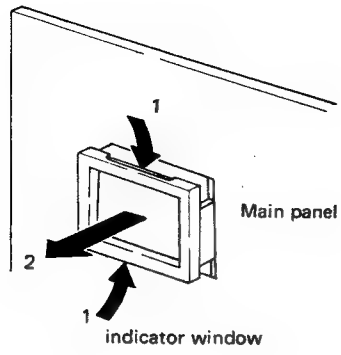
- Do not apply an external signal to the output signal terminals.
  Also, place a 4700-ohm pull-up resistor between Vcc.
- Apply the signals with the determined timing to the DATA I/O connectors.
  Drive is by open collector and place a 4700-ohm pull-up resistor.
- Apply the determined signals to the input connectors.
- All the signals are TTL level. (FAN OUT 1)
- The maximum possible power supply for the +5 V connector is 300 mA.
  Therefore, wherever possible use an external power supply.
- For connections to these connectors, use the D-type or D-sub type plug (Refer to page 1-3).



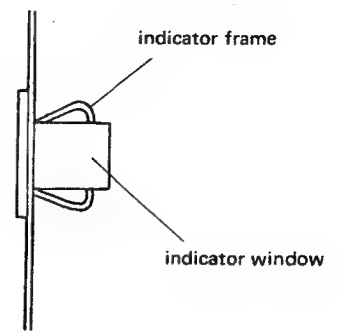
When G1 and G2 are within this division (Gg), the AND appears to be more than the write-in pulse (2H) and locates within the track, the reader will be locked to the generator at the same time.

1-8. ATTACHMENT OF INDICATOR

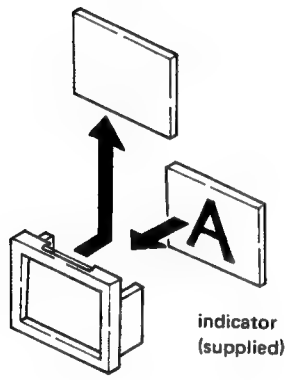
①



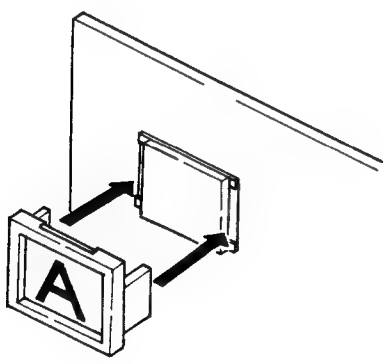
④



②



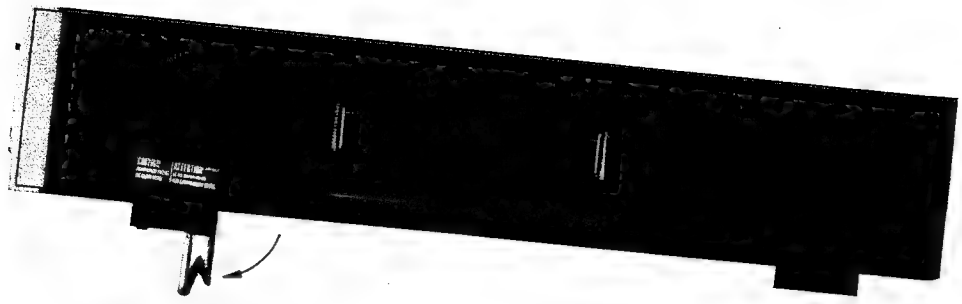
③



1	2	3	4	5
6	7	8	9	10
A	B	C	D	E
F	G	H	J	K

For tally indication, tear off the numerals and letters and use.

1-9. TABLE-TOP USE

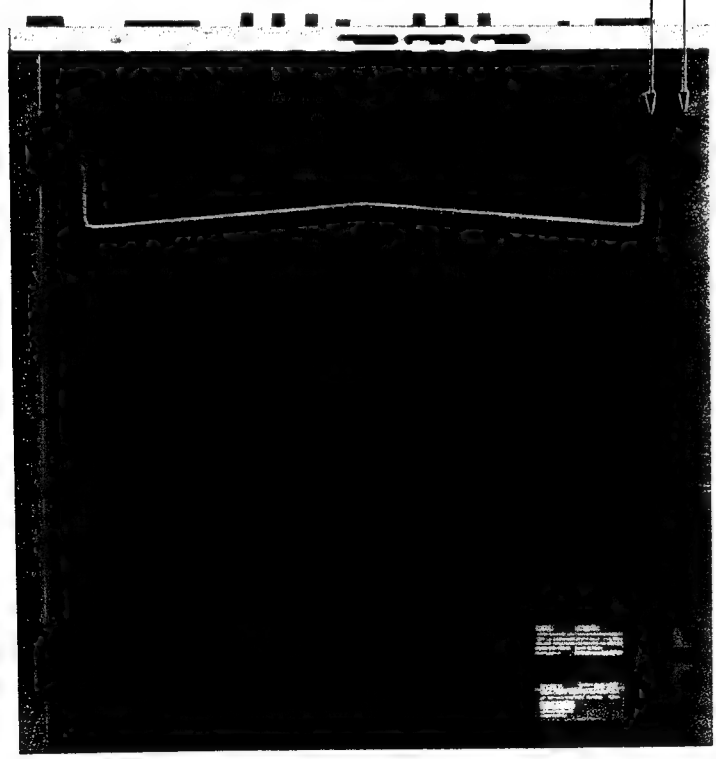


Reclining foot

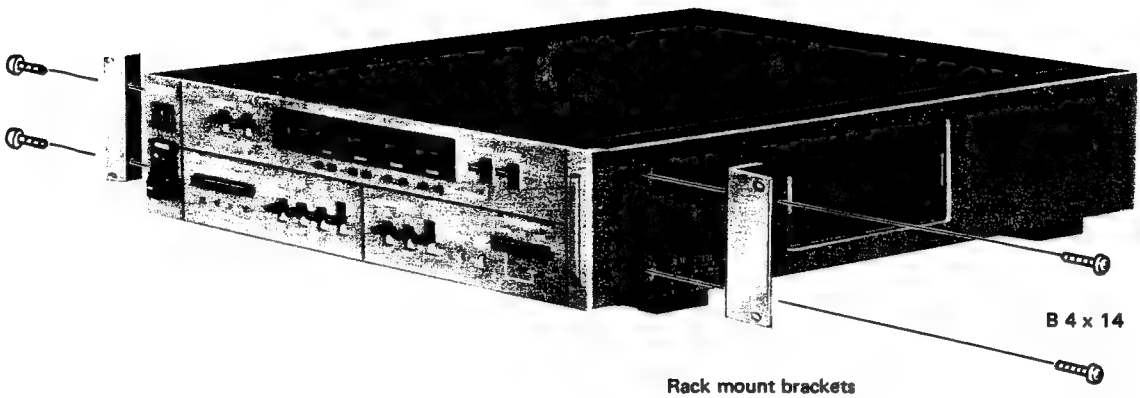
When operating the unit on a table, etc., pull out the reclining foot for easiest handling.

Detach the four feet when rack mounting and when lowering the unit's height.

(To detach, push the clip and slide.)



1-10. ATTACHMENT OF RACK MOUNT BRACKETS



Rack mount brackets

SONY

ZEITCODE GENERATOR/LESEGERÄT

BVG-1000

BEDIENUNGS- UND WARTUNGSANLEITUNG

TEIL 1
BEDIENUNG

1-1. BESONDERE MERKMALE

Universaltyp

Dieses Modell kann in Verbindung mit NTSC-, PAL- und SECAM-Systemen verwendet werden. Es erzeugt und liest nicht nur den standardisierten Längsspur-Zeitcode aus, sondern auch einen Vertikalintervall-Zeitcode (VITC).

Der Ausgangszeitcode, entweder ein Längsspur- oder Vertikalintervall-Zeitcode, umfaßt 2 Halbbilder (1 Vollbild). Zusätzliche 4-Halbbild-Identifikation ist erforderlich, wenn ein 4-Halbbildfang-Zeitcode gewünscht wird. Näheres dazu im Abschnitt 1-7-2.

Vertikalintervall-Zeitcode

Bei Benutzung des INT/EXT Längsspur-Zeitcodes kann das Gerät den Zeitcode in die Video-Vertikalintervalle einfügen. Damit ist bei niedrigen Geschwindigkeiten, einschließlich Standbild, die Identifikation von Einzelbildern möglich.

Genaues Auslesen

Kombination von SMPTE/EBU-Zeitcode und VITC erlaubt das simultane und exakte Auslesen des Zeitcodes von Standbild bis Schnellvor- und Rücklauf bei jeder Bandgeschwindigkeit (von Standbild bis zum 128 fachen der normalen Bandgeschwindigkeit).

Eingebauter Zeichengenerator

Dieses Modell ist in der Lage, den Zeitcode dem Monitorbild überlagert abzubilden.

„Code-lock"-Funktion (Zeitcode-Synchronisation)

Dieses Gerät bietet die Möglichkeit, die ankommenden SMPTE/EBU-Zeitcode oder VITC zu synchronisieren (extrapolieren).

Anzeige externer Benutzer-Bits

Die Bits des Generators oder der Benutzer der Auslesefunktion können angezeigt werden.

Kompatibilität mit einem Computer

Der Anschluß [DATA I/O] kann zur Kombination dieses Modells mit einem Computer benutzt werden.(4-Bit-Daten, Parallelschaltung)

Stromausfall/Synchronisierung-Speicherfunktion

Dieses Modell ist mit Funktionen ausgestattet, die Speicherung und Anzeige kurzzeitiger Stromausfälle und Synchronabweichungen erlauben. Dies bedeutet, daß eine Überwachung der Zeitcodeerzeugung nicht notwendig ist.

Fernsteuerungsmöglichkeit

Die Funktionen der Funktionsbedienungstafel und der Ein- und Ausgang der digitalen Daten können alle ferngesteuert werden.

Gestellmontage

Das Gerät kann in ein der EIA-Norm entsprechendes 19-Zoll-Gestell eingebaut werden.

1-2. TECHNISCHE DATEN

1-2-1. Elektrik

ZEITCODE-EINGANG	0,5 bis 10 Vp-p 600/3 kOhm symmetrisch 0,15 bis 2,2 Vp-p 75 Ohm asymmetrisch
ZEITCODE-AUSGANG	0 bis +8 dBm (INT einstellbar) 600 Ohm symmetrisch
VIDEO-EINGANG	1 V p-p 75 Ohm Fehlerdämpfung −36 dB
VIDEO-AUSGANG	1 Vp-p 75 Ohm
LINEARITÄT	1%
DIFFERENTIAL-VERSTÄRKUNG	1%
DIFFERENTIAL-PHASE	1°
K-FAKTOR	1% (2T-Impuls)
FREQUENZGANG	30 Hz – 6 MHz ±0,2 dB
Signal-Rauschabstand	60 dBp-p Signal zu rms-Rauschen (100 kHz-Video fg RES)
Senkung	1,5%
VITC-GENERATOR	
Amplitude des codierten Zeitcodes	80 ± 10 IRE-Einheiten
Position	Zeile 10–26
Bit-Rate	113,75 fH kb/S fH ⟶ kHz
ZEITCODE-AUSLESEBEREICH	
Gesamtauslesebereich	Standbild bis 128 fache Normalgeschwindigkeit bei Vorlauf und Rücklauf Bei Automatikbetrieb: Automatisches Umschalten zwischen VITC und Standard-SMPTE/EBU-Zeitcode (Längsspur)
VITC-Auslesebereich	Standbild bis 2 fache Normalgeschwindigkeit bei Vorlauf und Rücklauf
Längsspur-Auslesebereich	1/16 bis 128 fache Normalgeschwindigkeit bei Vorlauf und Rücklauf
STROMVERSORGUNG	Wechselspannung 100/120/220/240 V (wählbar) 48–64 Hz
LEISTUNGSAUFNAHME	100 W

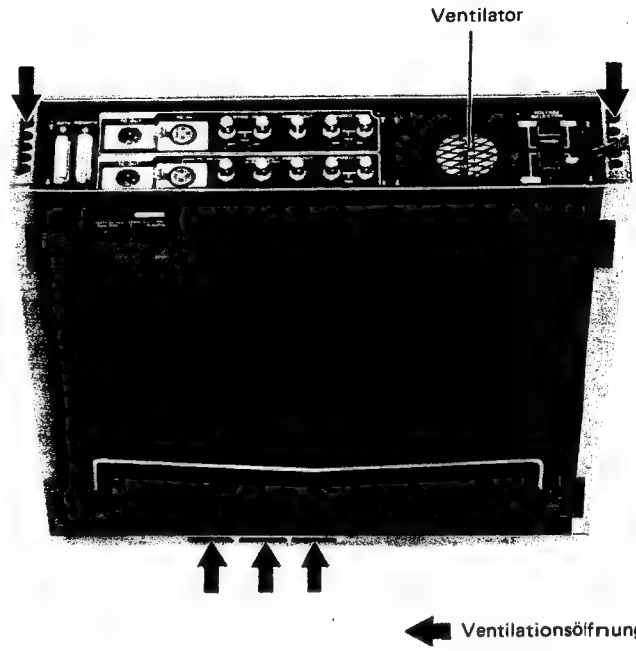
1-2-2. Mechanik

ANSCHLÜSSE		
Data I/O	25 p D-sub Buchse*	
Remote	25 p D-sub Stecker*	
Generatorteil		
time code out	3 p XLR	
time code in	3 p LXR	
sync in	BNC x2 durchgeschleift W/75 Ohm ON/OFF	
video out W/VITC	BNC	
video in	BNC }	durchgeschleift W/75 Ohm
return	BNC }	ON/OFF
Rekorderteil		
time code out	3 p XLR	
time code in	3 p XLR	
video out W/VITC	BNC	
video out W/Zeichen	BNC	
video in	BNC }	durchgeschleift W/75 Ohm
return	BNC }	ON/OFF
ABMESSUNGEN	424 (B) x 88 (H) x 446 (T) mm	
GEWICHT	ca. 13 kg	
ZUBEHÖR	Fernbedienungsanzeige	1 Satz
	Befestigungswinkel für Gestellmontage	1 Satz
	Sicherung	1
	Abdeckung	1
	Ausziehplatte	1

* Die Anschlüsse [DATA I/O] und [REMOTE] sind vom D-Typ oder D-sub-Typ. Betreffs geeigneter Anschlußstecker wenden Sie sich bitte an einen Anschlußteil-Hersteller. Die Modellnummer der Gegenstecker sind die folgenden:
für DATA I/O: D-25-P mit Gehäuse
für REMOTE: D-25-S mit Gehäuse
Die Befestigungsschrauben des BVG-1000 haben eine metrische Steigung (3 mm Durchmesser bei früheren Ausführungen und 2,6 mm bei gegenwärtiger Ausführung). Wenn die Befestigungsschrauben Ihres Anschußsteckers eine Zollsteigung haben, wechseln Sie die Befestigungsschrauben des BVG-1000 durch Schrauben mit einer geeigneten Zollsteigung aus.

1-3. ZUR BESONDEREN BEACHTUNG VOR DER INBETRIEBNAHME

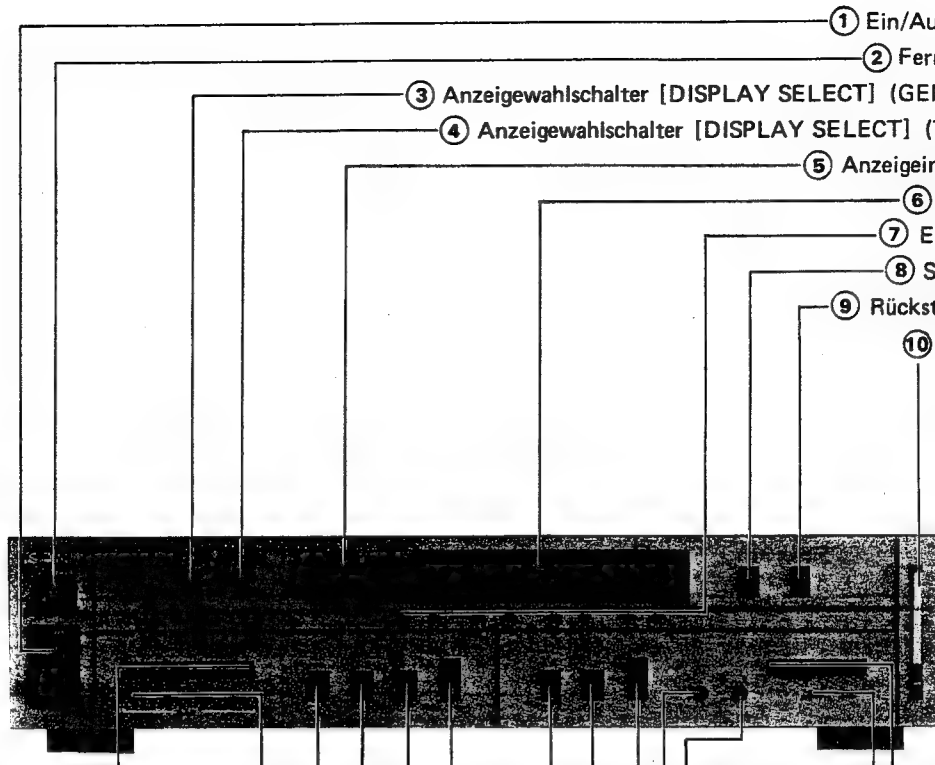
- Achten Sie darauf, daß die Umgebungstemperaturen, unter denen das Gerät benutzt wird, nicht außerhalb des Bereiches von 0°C bis 40°C liegen.
- Benutzen Sie das Gerät nicht in der Nähe einer Wärmequelle.
- Blockieren Sie nicht den Ventilator und die Ventilationsöffnungen (siehe die Abbildung unten).



- Lassen Sie einen Raum von mindestens 30 cm zwischen Geräterückwand und Wand bzw. einer anderen Fläche frei.
- Schließen Sie stets die Funktionsbedienungstafel, nachdem Sie interne Einstellungen vorgenommen haben.
- Geben Sie dem Gerät eine Aufwärmzeit von etwa 15 Minuten vor dem tatsächlichen Gebrauch.

1-4. BESCHREIBUNG DER TEILE UND BEDIENUNGSELEMENTE

1-4-1. Funktionsbedienungstafel



ALLGEMEINER TEIL

① Ein/Aus-Schalter [POWER]
② Fernbedienungsindikator
③ Anzeigewahlschalter [DISPLAY SELECT] (GENERTOR/READER)
④ Anzeigewahlschalter [DISPLAY SELECT] (TIME CODE/U-BIT]
⑤ Anzeigeindikator [DISPLAY]
⑥ Numerische Anzeige
⑦ Einstellschalter [SET]
⑧ Stopschalter [HOLD]
⑨ Rückstellschalter [RESET]
⑩ Verriegelungshebel

GENERATORTEIL

⑪ Bezugsquellenwahltasten [SOURCE SELECT]
⑫ Synchronisierungsindikatoren [LOCK]
⑬ Bezugssignal-Wahlschalter [REF]
⑭ Vertikalintervall-Zeitcode-Ein/Aus-Schalter [VITC ON/OFF]
⑮ Bildausfall-Ein/Aus-Schalter [DROP FRAME ON/OFF]
⑯ Benutzer-Bit-Wahlschalter [U-BIT]

LESETEIL

⑰ Zeichengenerator-Ein/Aus-Schalter [CHARACTER ON/OFF]
⑱ Fehlerumgehungsschaltung-Ein/Aus-Schalter [ERROR BYPASS ON/OFF]
⑲ Vertikalintervall-Zeitcode-Schalter [VITC]
⑳ Fehlerindikator [ERROR]
㉑ Bildausfallindikator [DROP FRAME]
㉒ Eingangswahltasten [INPUT SELECT]
㉓ Eingangsindikatoren [INPUT SELECT]

ALLGEMEINER TEIL

① **Ein/Aus-Schalter [POWER]**

② **Fernbedienungsindikator**
Dieser Indikator leuchtet auf, wenn das Gerät ferngesteuert wird.

③ **Anzeigewahlschalter [DISPLAY SELECT] (GENERATOR/READER)**
GENERATOR: Die Lampe [GENERATOR] von den Anzeigeindikatoren leuchtet auf als Anzeige dafür, daß der Generatorausgang angezeigt wird.
READER: Die Lampe [READER] von den Anzeigeindikatoren leuchtet auf als Anzeige dafür, daß der Eingang ausgelesen wird.

④ **Anzeigewahlschalter [DISPLAY SELECT] (TIME CODE/U-BIT)**
TIME CODE: Die Anzeige bezieht sich auf den Zeitcode.
U-BIT: Die Anzeige bezieht sich auf die Benutzer-Bits.

⑤ **Anzeigeindikator [DISPLAY]**
Dieser Indikator besteht aus zwei Teilen: Das eine zeigt an, daß der Generatorausgang angezeigt wird, und das andere dient als Anzeige dafür, daß der Eingang ausgelesen wird.

⑥ **Numerische Anzeige**
Achtstellige Anzeige des Zeitcodes oder der Benutzer-Bits.
Gleichzeitige Anzeige des Halbbildes (gerade oder ungerade) zusammen mit der Zeitcodeanzeige.
- Die Halbbildmarkierung geschieht durch eine LED nur für die äußerste rechte Stelle der Ausleseanzeige, ungeachtet der Stellung des Wahlschalters [GENERATOR/READER].
- Die folgenden Symbole werden für die Benutzer-Bits angezeigt, wenn die Daten auf einer von A bis F reichenden hexadezimalen Bezeichnung beruhen:
A → ⊏, B → ⊐, C → ⊔, D → ⊑, E → ⊢, F → keine Anzeige.

⑦ **Einstellschalter [SET]**
Zum Setzen des Ausgangswertes des vom Generator erzeugten Zeitcodes oder der spezifischen Ziffern der Benutzer-Bits. Vor dem Einstellen die numerische Anzeige auf GENERATOR-Anzeige schalten und dann den Zeitcode bzw. die Benutzer-Bits wählen/halten.

⑧ **Stopschalter [HOLD]**
Zum Stoppen des Generators oder des Auslesevorgangs.
Bei Betätigung dieses Schalters erscheint ein Punkt links unter jeder Ziffer der numerischen Anzeige. (Diese Punkte leuchten auf.)
Dieser Schalter kann in Verbindung mit dem Rückstellschalter zu wiederholtem Haltebetrieb und zum Beenden des Haltebetriebes verwendet werden. Wenn der Generator (oder der Lesevorgang) angehalten und die numerische Anzeige auf Auslesen (oder Generator) umgeschaltet wird, wird die Haltefunktion des Generators (oder Ausleseteils) beendet.

⑨ **Rückstellschalter [RESET] (Momentanschalter)**
Bei gestopptem Generator werden auf Druck dieses Schalters sämtliche Stellen auf Null zurückgestellt.

⑩ **Verriegelungshebel**
Den Hebel unten drücken, herausklappen und nach vorne herausziehen. Die Funktionsbedienungstafel kann dann nach links aufgeklappt werden.

GENERATORTEIL

⑪ **Bezugsquellenwahltasten [SOURCE SELECT]**
Mit diesen Tasten wird die Bezugsquelle für den Zeitcode des Generators gewählt.
REF: Bei ausgeschalteter Haltefunktion des Generators wird das über die Anschlüsse ⑧ VIDEO IN oder ⑤ SYNC IN der Anschlußplatte eingespeiste Video- oder Synchronisignal als Bezugsquelle genommen und synchronisiert.
EXT CODE: Gebrauch dieser Taste macht den über den Anschluß ④ TIME CODE IN der Anschlußplatte eingespeisten Zeitcode als abgetastete Bezugsquelle verfügbar.
READER: Bei Gebrauch dieser Taste ist der VITC (mit den Tasten [INPUT SELECT] gewähltes Signal) oder der über die Anschlüsse ⑩ TIME CODE IN der Anschlußplatte eingespeiste Zeitcode als abgetastete Bezugsquelle verfügbar.
Unter normalen Betriebsbedingungen ist es notwendig, daß die Zeitcode- bzw. Vertikalintervall-Zeitcode-Signale mit den Bezugssignalen synchronisiert sind.
LINE: Bei ausgeschalteter Halterfunktion des Generators wird auf die Netzfrequenz Bezug genommen und synchronisiert.
- Verschiedene Netzfrequenzen (50 oder 60 Hz) werden automatisch festgestellt, und der SMPTE- oder EBU-Zeitcode wird erzeugt.
- Wenn keine Bezugssignale anliegen, wird automatisch mit der Netzfrequenz synchronisiert.

⑫ **Synchronisierungsindikatoren [LOCK]**
Wenn der Phasensynchronisierungsschaltkreis (PLL) des Generators mit den über die Tasten [SOURCE SELECT] gewählten Signalen synchronisiert ist, leuchtet der entsprechende LED-Indikator auf.

⑬ **Bezugssignal-Wahlschalter [REF]**
VIDEO: Bei gedrückter Taste [REF SOURCE SELECT] stehen Videosignale als Referenzsignale zur Verfügung.
SYNC: Bei gedrückter Taste [REF SOURCE SELECT] stehen Synchronisignale als Referenzsignale zur Verfügung.
- Wenn dieser Schalter auf SYNC steht und der Zeichengenerator des Leseteils zur überlagerten Abbildung des Zeitcodes oder der Benutzer-Bits auf dem Monitor verwendet wird, bleiben der Zeitcode bzw. die Benutzer-Bits stabil, selbst wenn die über die Anschlüsse ⑩ TIME CODE IN der Anschlußplatte eingespeisten Videosignale von Band nicht mit den Synchronisignalen übereinstimmen.
(Dies bedeutet, daß der Zeitcode bzw. die Benutzer-Bits stabil auf derselben Stelle des Monitor-Bildschirms bleiben.)

⑭ **Vertikalintervall-Zeitcode-Ein/Aus-Schalter [VITC ON/OFF]**
ON: Wenn der Wahlschalter ⑬ REF auf VIDEO gestellt ist, wird den an den Generator angeschlossenen Videosignalen der Vertikalintervall-Zeitcode (VITC) hinzugefügt.

OFF: Der VITC ist abgeschaltet.
- Wenn der Wahlschalter (13) REF auf SYNC steht, basiert die Position des VITC auf der SYNC-Information.
- Unter normalen Betriebsbedingungen sollten Video- und Synchronsignale miteinander verriegelt sein.
- Wenn die Taste [LINE SOURCE SELECT] gedrückt ist, wird der Zeitcode unnormalen Betriebsbedingungen unterworfen, wodurch der von der Netzfrequenz abgetastete Wert dem VITC hinzugefügt wird.

(15) **Bildauslaß-Ein/Aus-Schalter [DROP FRAME ON/OFF]**

ON: Wenn der SMPTE-Zeitcode und der VITC für NTSC-Signale erzeugt werden, wird das Gerät auf Bildauslaßbetrieb geschaltet.

OFF: Kein Bildauslaßbetrieb.

Beim EBU-Zeitcode kann der Schalter auf ON oder OFF stehen, da keine Veränderung stattfindet. Allerdings muß der SECAM/PAL/NTSC-Schalter auf der VIDEO-Printplatine auf entweder SECAM oder PAL gestellt werden.

(16) **Benutzer-Bit-Wahlschalter [U-BIT]**

THRU: Wenn die Taste [READER] oder [EXT CODE SOURCE SELECT] gedrückt ist, stehen die ausgelesenen Daten als Benutzerbits zur Verfügung.
Bei Direkteingang zur Sammelschiene des Anschlusses (1) DATA I/O auf der Anschlußplatte stehen die Daten als Benutzer-Bits zur Verfügung.
- Wenn kein Eingang vom Leseteil und dem Anschluß [DATA I/O] vorliegt, werden die Benutzer- Bits vom Generator erzeugt.

INT: Die Benutzer-Bits werden vom Generator erzeugt.

EXT: Die Benutzer-Bits werden über den Eingang vom Anschluß (1) DATA I/O auf der Anschlußplatte erzeugt.
Wenn kein Eingang am Anschluß [DATA I/O] anliegt, werden die Benutzer-Bits anhand der ausgelesenen Daten erzeugt.
- Wenn kein Eingang am Lesegerät und am Anschluß [DATA I/O] anliegt, werden die Benutzer-Bits vom Generator erzeugt.

LESETEIL

(17) **Zeichengenerator-Ein/Aus-Schalter [CHARACTER ON/OFF]**

ON: Mit Hilfe des Zeichengenerators können der Zeitcode oder die Benutzer-Bits den dem Leseteil zugeleiteten Videosignalen überlagert werden. Während der Zeitcode oder die Benutzer-Bits ausgelesen werden, kann die überlagerte Abbildung am Monitor gesehen werden.
- Wenn der Wahlschalter (13) REF auf SYNC steht und ein Synchronisignal anliegt, bleiben die überlagerten Zeichen selbst bei Fluktuationen der Videobandgeschwindigkeit stabil.
- Die folgenden Symbole werden für die Benutzer-Bits angezeigt, wenn die Daten auf einer von A bis F reichenden hexadezimalen Bezeichnung beruhen:
A→: , B→; , C→< , D→= , E→> , F→ ?

(18) **Fehlerumgehungsschaltung-Ein/Aus-Schalter [ERROR BYPASS ON/OFF]**

ON: Der Fehlerumgehungsschaltkreis ist aktiviert.
Mit Hilfe des Schalters auf der gedruckten Leiterplatte kann die Länge der Fehlerumgehung bis zu 15 Bildern gewählt werden.

OFF: Der Fehlerumgehungsschaltkreis ist außer Funktion.

(19) **Vertikalintervall-Zeitcode-Schalter [VITC]**

THRU: Die anliegenden Videosignale werden unverarbeitet ausgelesen.

ON: Zur Hinzufügung des VITC zu den Videosignalen oder zum Ersetzen eines vorher hinzugefügten VITC durch neue Werte.
Wenn die anliegenden Videosignale einen VITC enthalten, wird dieser neu codiert, den Eingangssignalen hinzugefügt und in der korriegierten Form ausgelesen.
- Ein vorher hinzugefügter VITC kann dann durch neue Werte ersetzt werden, wenn die Position des vorherigen VITC (die von dem Code eingenommenen 3 Zeilen im Vertikalintervall) mit der Position des neuen VITC identisch ist.
Die 3 Zeilen, die der eingefügte VITC einnimmt, können mit Hilfe des Schalters auf der gedruckten Leiterplatte gewählt werden.
(Es wird empfohlen, die VITC-Information in die aktiven Perioden der Zeilen 12, 13 und 14 jedes Halbbildes beim NTSC-System einzufügen.)

OFF: Diese Schalterstellung benutzen, wenn VITC-Signale nicht eingefügt werden, oder wenn sie herausgenommen werden sollen.
- Wie in der Beschreibung der ON-Position bemerkt, müssen beim Entfernen eines alten VITC die VITC-Positionen identisch sein.

(20) **Fehlerindikator [ERROR]**

Aufleuchten dieses Indikators bedeutet, daß beim Auslesen ein Zeitcodefehler entdeckt worden ist. Dieser Indikator leuchtet ungeachtet der Stellung des Schalters [ERROR BYPASS ON/OFF] auf. Die Anzeige zeigt den korrekten Wert innerhalb der Grenzen der Fehlerumgehung an (wenn der Shalter [ERROR BYPASS ON/OFF] auf ON steht).

(21) **Bildauslaßindikator [DROP FRAME]**

Dieser Indikator leuchtet auf, wenn beim Auslesen des SMPTE-Zeitcodes und des VITC in Bezug auf NTSC-Signale der Zeitcode auf Bildauslaßbetrieb geschaltet wird.

(22) **Eingangswahltasten [INPUT SELECT]**

AUTO: Wenn das Band mit mehr als der Hälfte der normalen Wiedergabegeschwindigkeit läuft, wird der SMPTE/EBU-Zeitcode automatisch ausgelesen.
Wenn das Band mit weniger als der Hälfte der normalen Widergabegeschwindigkeit läuft, wird der VITC ausgelesen.

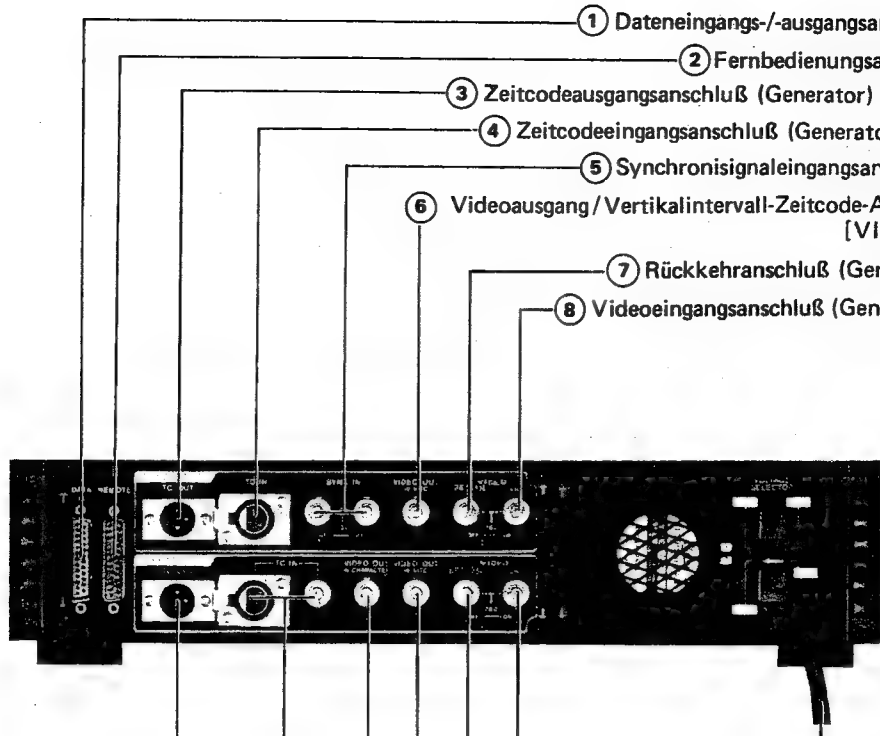
TC: Diese Taste drücken, wenn der SMPTE/EBU-Zeitcode bei einer Bandgeschwindigkeit von 1/16 bis zum 128 fachen der normalen Wiedergabegeschwindigkeit ausgelesen werden soll.

VITC: Diese Taste drücken, wenn der VITC bei einer Bandgeschwindigkeit von 0 bis zum Doppelten der normalen Wiedergabegeschwindigkeit ausgelesen werden soll.

(23) **Eingangsindikatoren [INPUT SELECT]**

Wenn die Taste [AUTO INPUT SELECT] gedrückt ist, leuchtet der Indikator [TC] oder [VITC] unter den Tasten [INPUT SELECT] auf, um anzuzeigen, welche Art von Zeitcode ausgelesen wird.

1-4-2. Anschlußplatte



① Dateneingangs-/-ausgangsanschluß [DATA I/O]
② Fernbedienungsanschluß [REMOTE]
③ Zeitcodeausgangsanschluß (Generator) [TIME CODE OUT]
④ Zeitcodeeingangsanschluß (Generator) [TIME CODE IN]
⑤ Synchronisignaleingangsanschlüsse [SYNC IN]
⑥ Videoausgang / Vertikalintervall-Zeitcode-Anschluß (Generator) [VIDEO OUT W/VITC]
⑦ Rückkehranschluß (Generator) [RETURN]
⑧ Videoeingangsanschluß (Generator) [VIDEO IN]
⑨ Zeitcodeausgangsanschluß (Leseteil) [TIME CODE OUT]
⑩ Zeitcodeeingangsanschlüsse (Leseteil) [TIME CODE IN]
⑪ Videoausgang/Zeichen-Anschluß [VIDEO OUT W/CHARACTER]
⑫ Videoausgang/Vertikalintervall-Zeitcode-Anschluß (Leseteil) [VIDEO OUT W/VITC]
⑬ Rückkehranschluß (Leseteil) [RETURN]
⑭ Videoeingangsanschluß (Leseteil) [VIDEO IN]
⑮ Netzkabel

① **Dateneingangs-/-ausgangsanschluß [DATA I/O]**
Eingangs-/Ausgangsanschluß für Generator-/Auslesedaten und Zeitsignale.
4-Bit-Daten Parallelsammelschiene (für weitere Einzelheiten siehe das später aufgeführte Material).

② **Fernbedienungsanschluß [REMOTE]**
Erlaubt die Fernsteuerung der Funktionen der Funktionsbedienungstafel.

③ **Zeitcodeausgangsanschluß (Generator) [TIME CODE OUT]**
Belastungsimpedanz: 600 Ohm
Ausgangsanschluß für den vom Generator erzeugten Längsspur-Zeitcode.

④ **Zeitcodeeingangsanschluß (Generator) [TIME CODE IN]**
Eingangsimpedanz: 600/3 k-Ohm (wählbar auf der gedruckten Leiterplatte)
Eingangsanschluß zur Synchronisierung des Generators dieses Gerätes mit einem ankommenden SMPTE/EBU-Zeitcode.
Der Eingangszeitcode hat eine normaler Wiedergabe entsprechende Bit-Geschwindigkeit.

⑤ **Synchronisignaleingangsanschlüsse [SYNC IN]**
Eingangsanschlüsse für externe Synchronsignale, Brückenausgang, Abschlußwiderstand ON/OFF
Bei Gebrauch der Bedienungselemente auf der Funktionsbedienungstafel und Schaltung des Gerätes auf externe Synchronisierung werden der Zeitcode des Generators und die Schaltkreise des Leseteils zur Zeichenerzeugung minimal von Rauschen beeinflußt.

⑥ **Videoausgang/Vertikalintervall-Zeitcode-Anschluß (Generator) [VIDEO OUT W/VITC]**
Ausgangsanschluß für das Video-Signal des Videoeingangsanschlusses [VIDEO IN] ⑧ ,dem der VITC zugegeben wurde. Enthält das Eingangssignal einen VITC, kann an diesem Ausgang auch ein Signal abgenommen werden, dessen VITC durch einen vom Generator erzeugten neuen VITC ersetzt wurde. In diesem Falle sind die Schalter [POSITION] ⑥ und [WIDTH] ⑦ auf der gedruckten Leiterplatte so zu stellen, daß auch die Zeilen des ankommenden Video-Signals erfaßt werden, die den VITC tragen.

⑦ **Rückkehranschluß (Generator) [RETURN]**

⑧ **Videoeingangsanschluß (Generator) [VIDEO IN]**
Zur Brückenschaltung mit dem Anschluß ⑦ [RETURN], Abschlußwiderstand ON/OFF
An diesen Anschlüssen anliegende Videosignale dienen als Bezugsdaten für den Generator.
Diesen Anschlüssen Videosignale zuleiten, wenn die Hinzufügung des VITC zu diesen Signalen gewünscht wird. Die Signale am Anschüuß ⑥ [VIDEO OUT W/VITC] abnehmen.

⑨ **Zeitcodeausgangsanschluß (Leseteil) [TIME CODE OUT]**
Belastungsimpedanz: 600 Ohm
Ausgangsanschluß für den Längsspur-Zeitcode, der entweder vom über den TIME CODE IN-Anschluß ④ eingespeisten SMPTE/EBU-Zeitcode oder vom VIDEO IN-Anschluß ⑧ eingespeisten VITC regeneriert ist.
Die Regenerationsfunktion kann mit Hilfe des Schalters auf der gedruckten Leiterplatte wie folgt gewählt werden.

a) Der vom Leseteil ausgelesene Zeitcode wird durch die normale Wiedergabe-Bit-Geschwindigkeit ersetzt. (Die Zeitzählung ist exakt die gleiche wie die für den Generator.)
b) Die Amplituden des Eingangszeitcodes werden verformt und hinausgeleitet.

⑩ **Zeitcodeeingangsanschlüsse (Leseteil) [TIME CODE IN]**
600/3 k-Ohm (wählbar auf der gedruckten Leiterplatte), symmetrisch
75 Ohm, asymmetrisch
Zwei Eingangsanschlüsse (symmetrisch und asymmetrisch) sind vorhanden, können aber nicht gleichzeitig benutzt werden.
Der asymmetrische Eingang hat eine größere Bandbreite als der symmetrische Eingang.

⑪ **Videoausgang/Zeichen-Anschluß [VIDEO OUT W/CHARACTER]**
Ausgangsanschluß für das gleiche Signal wie bei Anschluß [VIDEO OUT W/VITC] ⑫ , dem aber Lese-Zeitcode-Zeichen überlagert sind. Normalerweise werden die Ausgangssignale von diesem Anschluß zur Monitorüberwachung benutzt, sie können aber auch für indirekte Kopierschnitte verwendet werden.
Bei der Aufnahme des Signals werden die Zeichen in das Bild „eingebrannt". (Position, Breite und Höhe sind intern wählbar.) Bei SECAM-Signalen kann zusammen mit den Zeichen Rauschen erscheinen, so daß diese nur zur Monitorüberwachung benutzt werden.

⑫ **Videoausgang/Vertikalintervall-Zeitcode-Anschluß (Leseteil) [VIDEO OUT W/VITC]**
Ausgangsanschluß für das Video-Signal des Anschlusses [VIDEO IN] ⑭ mit VITC, der vom Leseteil anhand des SMPTE/EBU-Zeitcodes codiert wurde.
Enthält das eingespeiste Signal einen VITC, wird dieser ersetzt. In diesem Falle die Schalter [POSITION] ⑥ und [WIDTH] ⑦ der gedruckten Leiterplatte so einstellen, daß die den VITC des eingespeisten Video-Signals tragenden Zeilen erfaßt werden.

⑬ **Rückkehranschluß (Leseteil) [RETURN]**

⑭ **Videoeingangsanschluß (Leseteil) [VIDEO IN]**
Zur Brückenschaltung mit dem Anschluß ⑬ RETURN, Abschlußwiderstand ON/OFF
Eingangsanschlüsse für Videosignale von einer Videobandmaschine oder ähnlicher Ausrüstung.
Der VITC der Videosignale kann ausgelesen werden.
Die Video-Eingangssignale können an den Anschlüssen ⑪ VIDEO OUT W/CHARACTER und ⑫ VIDEO OUT W/VITC abgenommen werden.

1-4-3. Zur besonderen Beachtung beim Anschließen

Die Anschlüsse ⑦ (⑬) [RETURN] und ⑧ (⑭) [VIDEO IN] sowohl als auch die Anschlüsse ⑤ [SYNC IN] sind durchgeschleifte Anschlüsse und können brückengeschaltet werden.

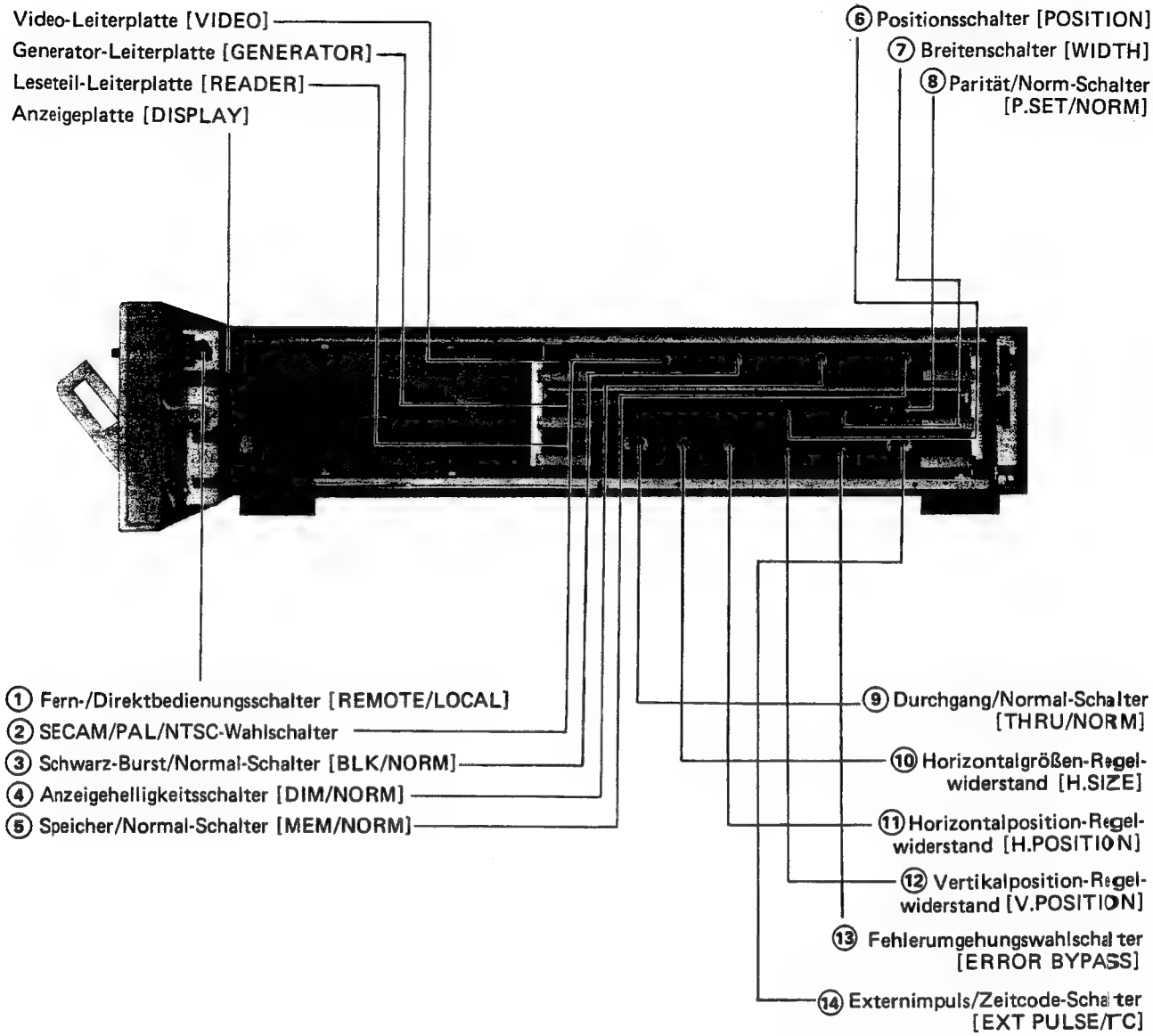
Daher stets die Ein/Aus-Position der 75-Ohm-Abschlußwiderstände der Anschlüsse überprüfen.

Dieses Gerät ist so konstruiert, daß bei abgeschalteter Stromversorgung der Signalfluß von den Anschlüssen ⑥ und ⑫ [VIDEO OUT W/VITC] nicht unterbrochen ist. Achten Sie daher bei den Anschlüssen, einschließlich der oben erwähnten Brückenschaltungen, auf die folgenden Punkte.

- **Bei abgeschalteter Stromversorgung mit den Abschlußwiderständen der Anschlüsse [RETURN] und [VIDEO IN] auf ON:**
  Der Anschluß [VIDEO IN] ist sowohl mit den Anschlüssen [RETURN] als auch mit den Anschlüssen [VIDEO OUT] verbunden; gleichzeitig sind die internen Schaltkreise, einschließlich der Abschlußwiderstände, abgeschaltet. Die an den Anschluß [VIDEO IN] angeschlossene Signalquelle ist daher durch die an die Anschlüsse [VIDEO OUT] angeschlossene Belastung abgeschlossen.

- **Bei abgeschalteter Stromversorgung mit den Abschlußwiderständen der Anschlüsse [RETURN] und [VIDEOIN] auf OFF:**
  Der Anschluß [VIDEO IN] ist mit den Anschlüssen [VIDEO OUT] verbunden; gleichzeitig sind die internen Schaltkreise, einschließlich dem RETURN-Kreis und den Abschlußwiderständen, abgeschaltet.
  Die an den Anschluß [VIDEO IN] angeschlossene Signalquelle ist daher durch die an die Anschlüsse [VIDEO OUT] angeschlossene Belastung abgeschlossen.

1-4-4. Gedruckte Leiterplatten



- Alle Schiebeschalter stehen bei Normalbetrieb auf der rechten Position.

Anzeigeplatte [DISPLAY]

① **Fern-/Direktbedienungsschalter [REMOTE/LOCAL]**

REMOTE: Den Schalter nach oben stellen.
Der Fernbedienungsindikator auf der Funktionsbedienungstafel leuchtet auf, und die Bedienungselemente auf der Funktionsbedienungstafel sind außer Funktion gesetzt.

LOCAL: Das Gerät kann normal über die Bedienungselemente auf der Funktionsbedienungstafel bedient werden.

Video-Leiterplatte [VIDEO]

② **SECAM/PAL/NTSC-Wahlschalter**

SECAM: Für SECAM-Videosignale auf diese Position stellen.

PAL: Für PAL-Videosignale auf diese Position stellen.

NTSC: Für NTSC-Videosignale auf diese Position stellen.

③ **Schwarz-Burst/Normal-Schalter [BLK/NORM]**

BLK: Die in den Generator eingespeisten Videosignale können in Schwarz-Burstsignale umgeformt und abgenommen werden.
Bei Zuleitung von SECAM-Signalen wird Farbe hinzugefügt.

NORM: Position für Normalbetrieb (rechte Stellung).

③ **Anzeigehelligkeitsschalter [DIM/NORM]**

DIM Die Helligkeit der ersten beiden Stellen der numerischen Anzeige (10H, H) sowohl als auch die der beiden letzten Stellen (10F, F) wird verringert.

NORM: Position für Normalbetrieb (rechte Stellung)

⑤ **Speicher/Normal-Schalter [MEM/NORM]**

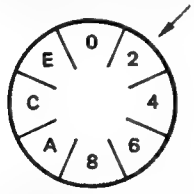
MEM: Die Stromversorgung wird kurzzeitig abgeschaltet, und die Synchronstörungen werden gespeichert.
unterbrochene Synchronisierung ⟶
Die Indikatoren [LOCK] blinken.
unterbrochene Stromversorgung ⟶
Die Indikatoren [LOCK] und die numerische Anzeige blinken.
Den Schalter auf NORM stellen, um das Blinken der Anzeige abzuschalten. Den Netzschalter [POWER] auf ON und dann diesen Schalter auf MEM stellen, um die unterbrochene Synchronisierung und Stromversorgung wiederherzustellen.

NORM: Position für Normalbetrieb (rechte Stellung) und zum Rückstellen der Anzeige, wie oben beschrieben.

Generator-Leiterplatte [GENERATOR]

⑥ **Positionsschalter [POSITION]**

Dieser Schalter bestimmt, in welche Zeile das VITC-Signal eingefügt wird. (Gilt für Generator und Leseteil)
Für NTSC-Signale diesen Schalter auf „2" stellen.
2: Zeile 12



⑦ **Breitenschalter [WIDTH]**

Mit diesem Schalter wird festgelegt, wieviele Zeilen das VITC-Signal umfaßt. (Gilt für Generator und Leseteil)
Für NTSC-Signale diesen Schalter auf „3" stellen.

⑧ **Parität/Norm-Schalter [P.SET/NORM]**

P.SET: Wenn dieser Schalter zum Zusammenfügen von SMPTE/EBU-Zeitcodes (Code-assembly) auf diese Position gestellt wird, können Anschlüsse mit dem Magnetmusterpegel des Bandes vorgenommen werden. Zur Kompensation wird das Bit 63 (das höchste Benutzer-Bit) als Paritätsbit benutzt.

NORM: Normalerweise bleibt der Schalter auf diese Position gestellt (rechte Stellung), um freien Gebrauch sämtlicher Benutzer-Bits zu ermöglichen.

Leseteil-Leiterplatte [READER]

⑨ **Durchgang/Normal-Schalter [THRU/NORM]**

THRU: Die Amplituden der in den Leseteil eingespeisten Zeitcodesignale werden umgeformt und hinausgeleitet.
Die Bit-Geschwindigkeit des Ausgangssignals ändert sich entsprechend dem Eingangssignal.

NORM: Der normale in den Leseteil eingespeiste Wiedergabezeitcode wird regeneriert, umgeformt und mit derselben Zeitzählung wie die des Generators hinausgeleitet. Wenn die Ausgangssignale beim Kopieren verwendet werden, findet keine Verschlechterung der Wellenformen statt.
(Bei normalem Wiedergabebetrieb.)

⑩ **Horizontalgrößen-Regelwiderstand [H.SIZE]**

Zum Einstellen der horizontalen Größe der Zeichen, die durch den Leseteil überlagert werden.

⑪ **Horizontalposition-Regelwiderstand [H.POSITION]**

Zur Einstellung der horizontalen Lage der Zeichen, die durch den Leseteil überlagert werden.

⑫ **Vertikalposition-Regelwiderstand [V.POSITION]**

Zur Einstellung der vertikalen Lage der Zeichen, die durch den Leseteil überlagert werden.

⑬ **Fehlerumgehungswahlschalter [ERROR BYPASS]**

Zur Wahl der Länge der erforderlichen Fehlerumgehung, zwischen 1 und 15 Bildern.
Wenn die Länge des Zeitcodes kürzer als die der Fehlerumgehung ist, werden die korrekten Werte auf der numerischen Anzeige angezeigt, selbst wenn der in den Leseteil eingespeiste Zeitcode falsch ist.
Wenn jedoch ein Zeitcode mit einem unstetigen Wert eingegeben worden ist, findet ein Sprung statt, und die Entdeckung des Sprungpunktes wird um eine Zeit verzögert, die der Länge der Fehlerumgehung entspricht.
Dies bedeutet, daß durch eine Verkürzung der Fehlerumgehung von vornherein bessere Ergebnisse erzielt werden, wenn der eingegebene Zeitcode von hoher Qualität ist.
Diesen Schalter normalerweise auf ON gestellt lassen.

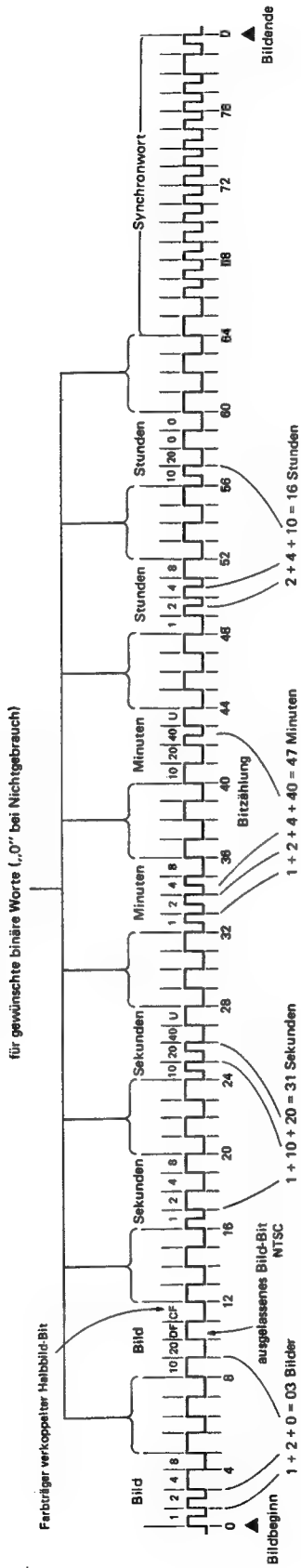
⑭ **Externimpuls/Zeitcode-Schalter [EXT PULSE/TC]**

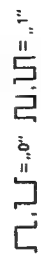
EXT PULSE: Bei niedriger Bandgeschwindigkeit des VTR wird der VITC ausgelesen, und bei hoher Bandgeschwindigkeit werden die Externimpulse (Vollbild) ausgelesen, z.B. unter Verwendung von CTL-Impulsen extern eingegebene Zeitcodeimpulse.
Der Schalter ⑱ ERROR BYPASS ON/OFF auf der Funktionsbedienungstafel muß auf ON stehen.

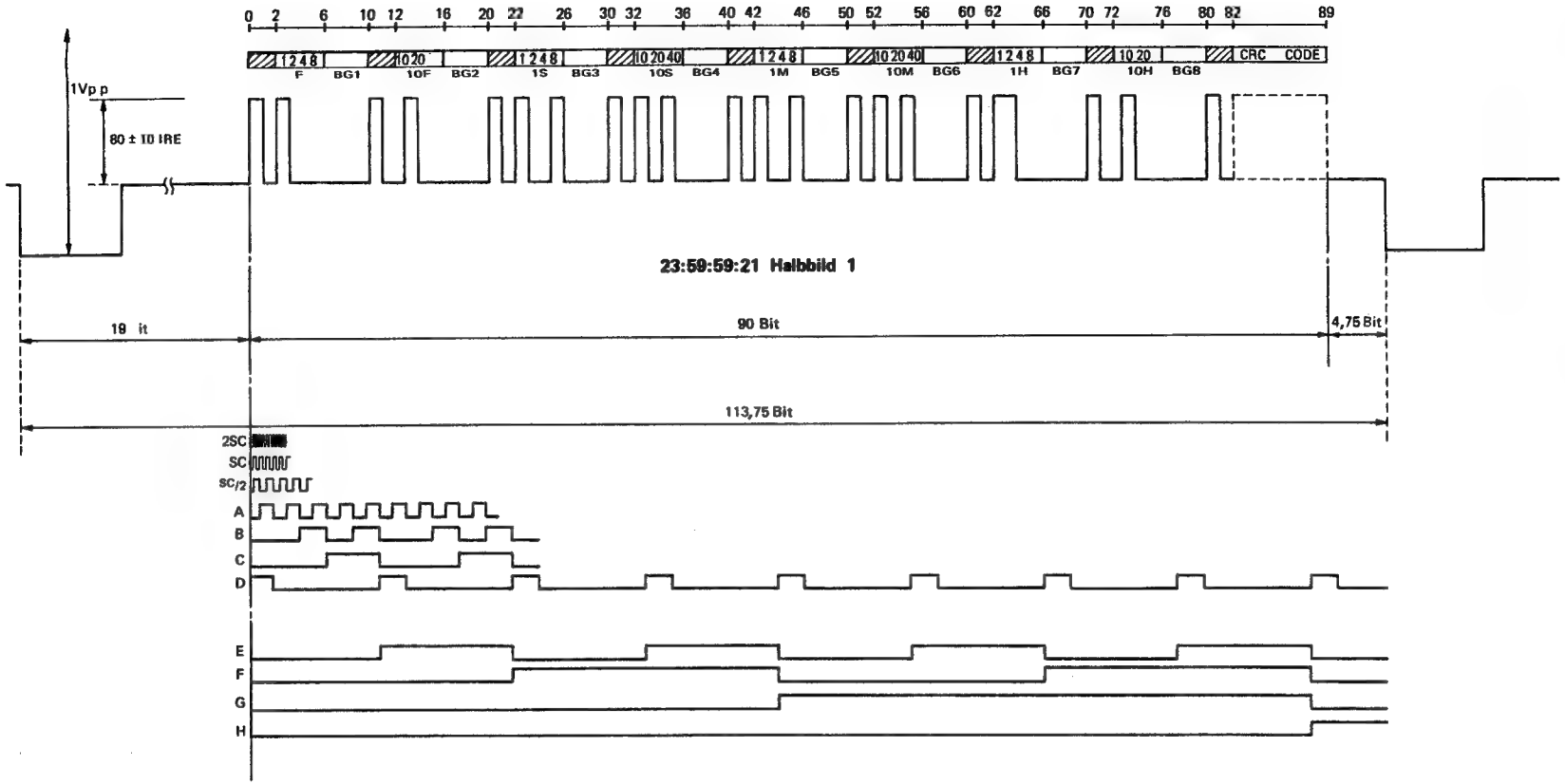
TC: Position für Normalbetrieb (rechte Stellung)

1-5. AMPLITUDENFORM

1-5-1. Standard-SMPTE/EBU-Zeitcode (1 Vollbild)







BG1 BG8 ... binäre Gruppe (Benutzer-Bit)

0–1	Synchronisier-Bits	0 fixe Eins 1 fixe Null
2–5	Bildeinheiten	
6–9	erste binäre Gruppe	(BG1)
10–11	Synchronisier-Bits	10 fixe Eins 11 fixe Null
12–13	Bild-Zehnerwerte	
14	Bildausfallmarkierung*	
15	Farb-Synchronsignal	
16–19	zweite binäre Gruppe	(BG2)
20–21	Synchronisier-Bits	20 fixe Eins 21 fixe Null

*1 „0", außer bei NTSC

*1 nur bei NTSC-Signalen

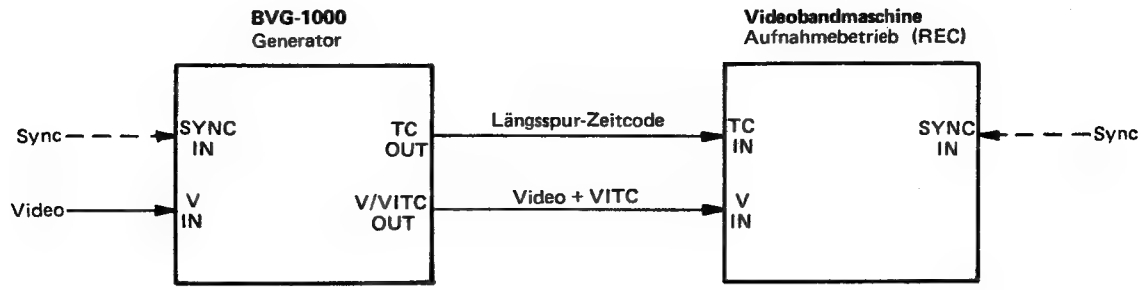
22–25	Sekundeneinheiten	
26–29	dritte binäre Gruppe	(BG3)
30–31	Synchronisier-Bits	30 fixe Eins 31 fixe Null
32–34	Sekunden-Zehnerwerte	
35	Halbbildbezeichnung	1,3 (5,7)*3 Halbbild . . . Null 2,4 (6,8) Halbbild . . . Eins
36–39	vierte binäre Gruppe	(BG4)
40–41	Synchronisier-Bits	40 fixe Eins 41 fixe Null
42–45	Minuteneinheiten	
46–49	fünfte binäre Gruppe	(BG5)
50–51	Synchronisier-Bits	50 fixe Eins 51 fixe Null

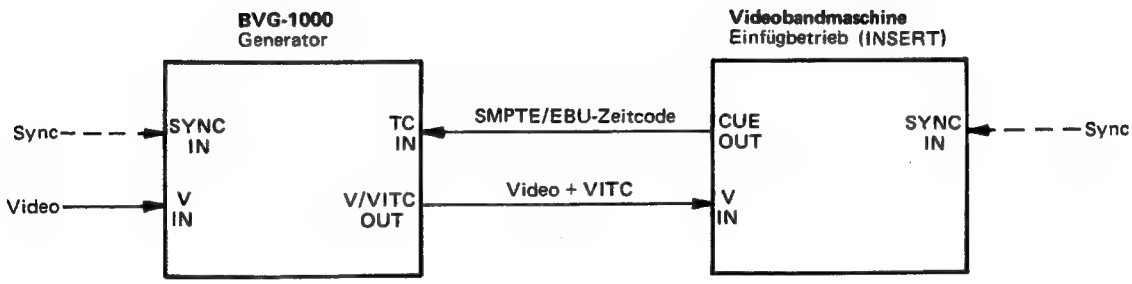
*1 Wert in den Klammern: nur bei PAL-Signalen

52–54	Minuten-Zehnerwerte	
55	unbelegtes Bit	(Null, solange nicht belegt)
56–59	sechste binäre Gruppe	(BG6)
60–61	Synchronisier-Bits	60 fixe Eins 61 fixe Null
62–65	Stundeneinheiten	
66–69	siebte binäre Gruppe	(BG7)
70–71	Synchronisier-Bits	70 fixe Eins 71 fixe Null
72–73	Stunden-Zehnerwerte	
74–75	unbelegte Bits	(Null, solange nicht belegt)
76–79	achte binäre Gruppe	(BG8)
80–81	Synchronisier-Bits	80 fixe Eins 81 fixe Null
82–89	CRC CODE (Zyklischer Redundanz-Prüfcode)	

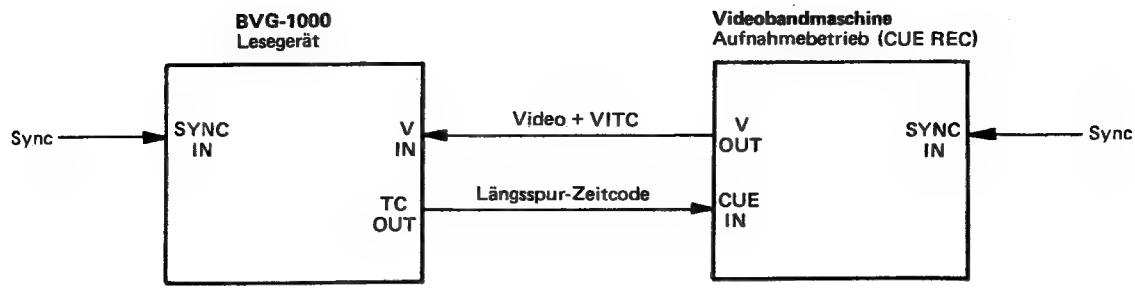
1-6. ANSCHLÜSSE (Variationen)

GENERATOR

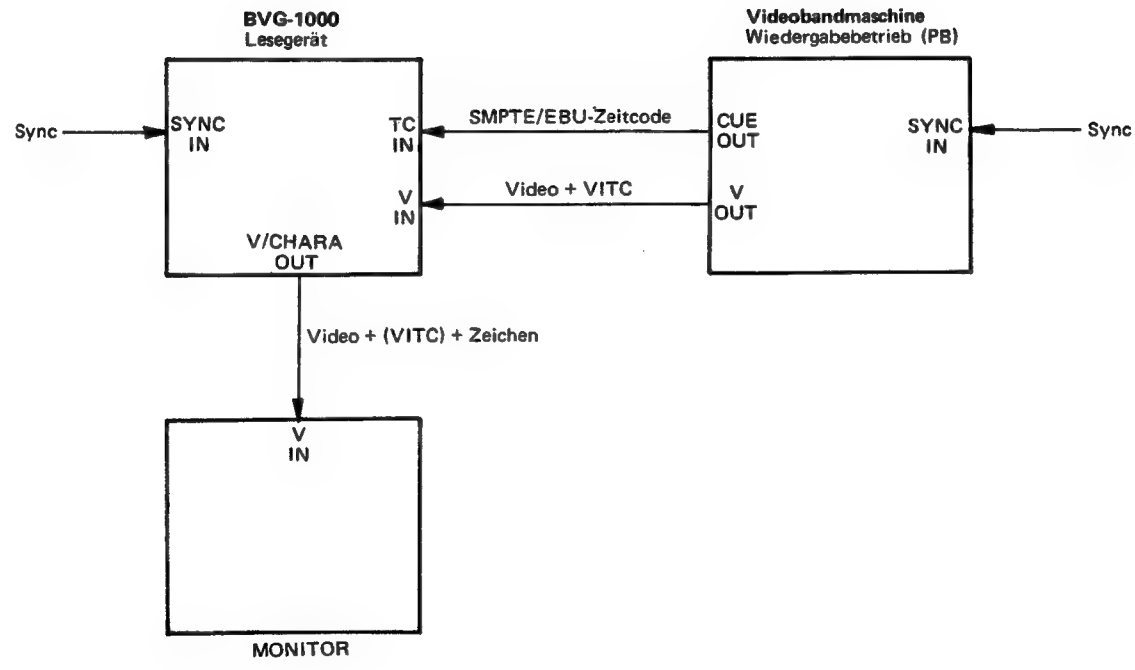




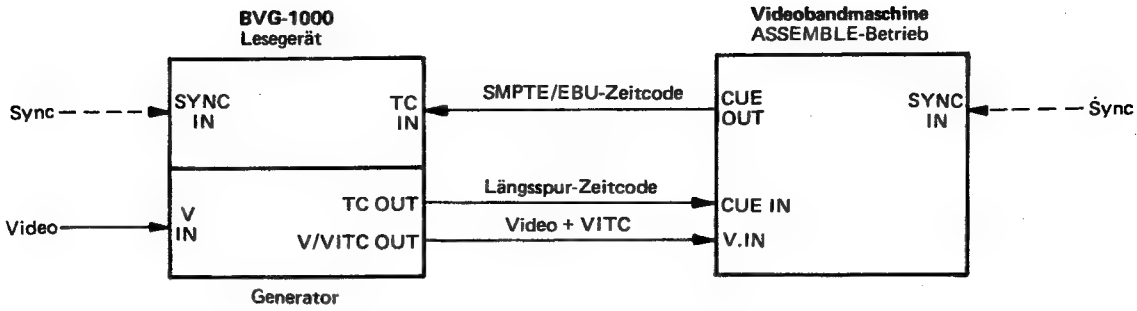
LESEGERÄT (GENERATOR)



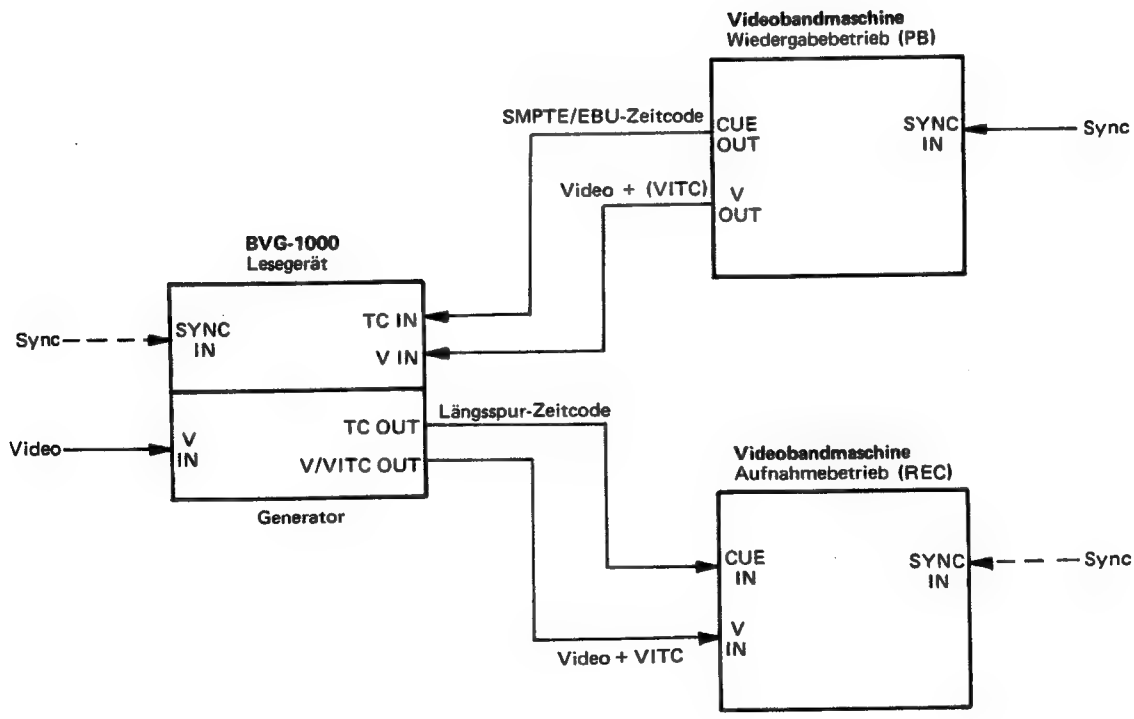
LESEGERÄT



GENERATOR/LESEGERÄT (Codesynchronisierung)



GENERATOR/LESEGERÄT (zwei Videobandmaschinen)



1-7. DIGITALE STEUERUNGSKOMBINATION

Durch einfache Kombination mit einem TTL-Pegel kann dieses Gerät mit anderen Komponenten gekoppelt werden (Videogeräte, Schneidemaschine, etc.). Vierzig Signale sind von der Mutterplatte verfügbar, und diese sind zwischen den Anschlüssen [DATA I/O] und [REMOTE] auf der Anschlußplatte verteilt.

Die folgenden Signale stehen an den Anschlüssen [DATA I/O] zur Verfügung:

Lesegerät- und Generator-Ausgangsdaten (TIME oder U-Bit)
Eingangsdaten zum Generator (TIME oder U-BIT)
Generator-Farbbildsynchronsignal (Zeitcode bei 15 Hz oder 12,5 Hz abgeglichen)
Generator-Codeschaltsignal und Bildauslaßbetrieb-(DF)-Ausgangssignal
Lesegerät-Halbbild-Ausgangssignal
Lesegerät-Vor/Rücklauf-Ausgangssignal

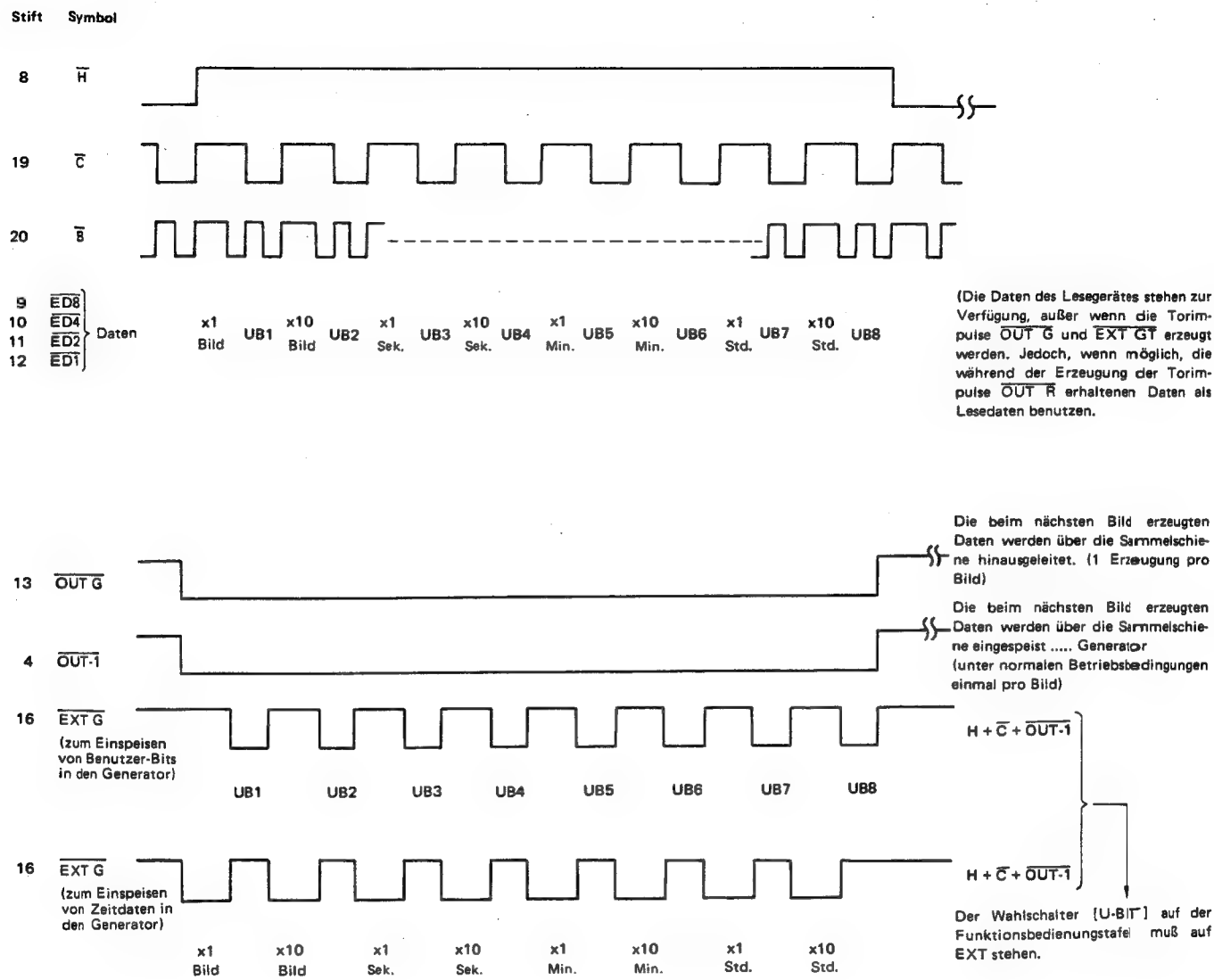
Sämtliche Funktionssignale der Funktionsbedienungstafel stehen an den Anschlüssen [REMOTE] zur Verfügung.

1-7-1. Bezeichnungen der Signale des Anschlusses [DATA I/O]

Stift	Symbol	Eingang/ Ausgang		Beschreibung
1				
2	GND			
3	GDF		Aus	Generator-Bildausfallbetriebssignal (Beim EBU-Zeitcode immer „L"-Pegel)
4	$\overline{\text{OUT 1}}$		Aus	Generator-Daten, anliegender Torimpuls
5	$\overline{\text{FIELD}}$		Aus	Lesegerät-Halbbildsignal
6	FWD		Aus	Lesegerät-Vor/Rücklauf-Signal
7	$\overline{\text{TMDL}}$		Aus	Lesegerät-Zeitcode/VITC-Schaltsignal
8	$\overline{\text{H}}$		Aus	Generator-Zeitsignal
9	$\overline{\text{ED8}}$	Ein	Aus	Signale der Daten-Sammelschiene
10	$\overline{\text{ED4}}$	Ein	Aus	
11	$\overline{\text{ED2}}$	Ein	Aus	
12	$\overline{\text{ED1}}$	Ein	Aus	
13	$\overline{\text{OUT G}}$		Aus	Daten der Sammelschiene müssen Generatorsignale sein
14	L A/4		Aus	Generator-Zeitsignal
15	$\overline{\text{LG}}$		Aus	Generator-Zeitsignal
16	$\overline{\text{EXT GT}}$	Ein		Daten der Sammelschiene müssen externe Signale sein
17	$\overline{\text{EXT}}$		Aus	Generator-Benutzerbit muß auf extern geschaltet sein
18	$\overline{\text{OUT R}}$		Aus	Daten der Sammelschiene müssen Signale des Lesegerätes sein
19	$\overline{\text{C}}$		Aus	Generator-Zeitsignal
20	$\overline{\text{B}}$		Aus	Generator-Zeitsignal
21	MAT	Ein		Signal zur Generator-Farbbildsynchronisation (15 Hz oder 12,5 Hz)
22	$\overline{\text{FRM}}$	Ein		Externes Zählsignal des Lesegerätes
23	$\overline{\text{FD}}$	Ein		Externes Zählsignal des Lesegerätes ist Vor- oder Rücklaufsignal
24	+5V			Gleichspannung +5 V (300 mA)
25				

1-7-2. Phase der Signale

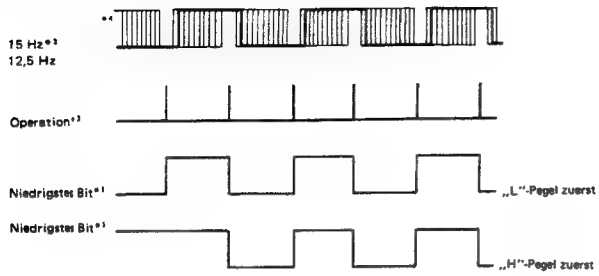
Die folgenden Signale für den GENERATOR und zur Ein-/Ausgabe von Daten (DATA I/O) verwenden.



● **Farbbildsynchronsignal über Stift [21 MAT] eingespeist**

Wenn die Generatoroperationen übereinandergreifen, wenn das Farbbildsynchron-Eingangssignal beim „L"-Pegel ist (dies ist nicht der Fall, wenn Daten von der Sammelschiene eingespeist werden), dann erfolgt keine Operation, wenn das niedrigste Bit*1 zwischen den Zeitcode x1 Bild-Daten beim „H"-Pegel ist.
Dies läßt sich graphisch wie folgt darstellen.

NTSC

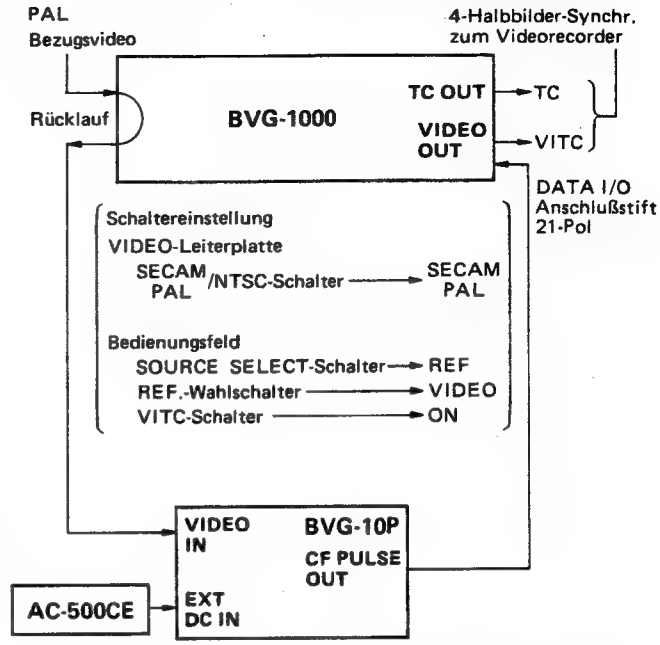


*2 Vor der Operation mit dem „L"-Pegel ist ein Minimum von mehr als 1 msec erforderlich.
*3 Das Operationssignal wird binnen eines Maximums von 0,3 msec ab dem Spannungsabfall von Stift [15 $\overline{LG}$] erzeugt.
*4 Entweder der „H"-Pegel oder der „L"-Pegel ist für die Polarität annehmbar.

Im Fall von EBU-Signalen sind die x1 Sekunden-Impulse wie in dem Diagramm bei 0, 2, 4, 8 aber bei 1, 3, 5, 7, 9 ist die Polarität des niedrigsten Bit +1 umgekehrt.

● **Anwendung der 4-Halbbilder-Synchronisierung**

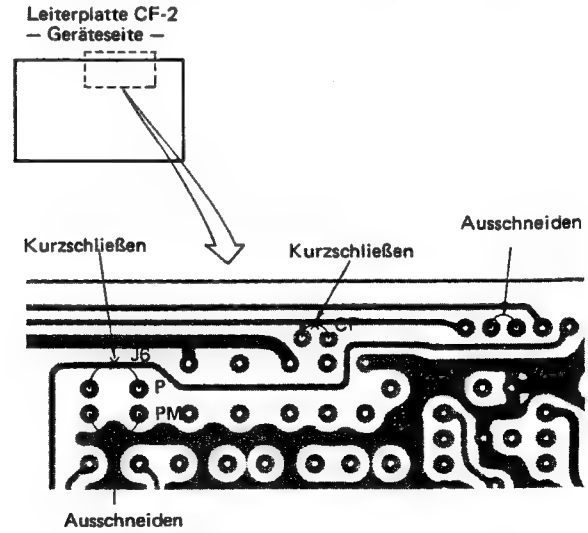
Wenn die 4-Halbbilder-Synchronisierung unter Benutzung des BVG-10P (gesondert lieferbar) geschieht, muß die Leiterplatte CF-2 des BVG-10P wie beschrieben modifiziert werden.



Zur Beachtung: Der BVG-10P hat zwei CF PULSE-Ausgangsanschlüsse auf dem Anschlußfeld. Der 4-Halbbilder-Impuls liegt am rechten CF PULSE-Ausgangsanschluß an.

1) Die vier Schrauben, mit denen die Gummifüße befestigt sind, abschrauben und die Anschlußplatte aufschieben und abnehmen.

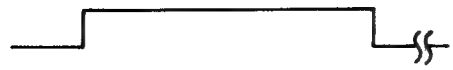
2) An der Leiterplatte CF-2 die folgenden Modifikationen vornehmen.



3) Die Abdeckplatte wieder anbringen.

Die folgenden Signale für das Lesegerät [READER] und zur Ein-/Ausgabe von Daten DATA I/O verwenden.

Beim Auslesen des Zeitcodes und von Benutzer-Bits [U-BIT]

Stift	Symbol	
8	$\overline{H}$	
19	$\overline{C}$	wie auf Seite . . . 19
20	$\overline{B}$	wie auf Seite . . . 19
9	$\overline{ED8}$	Daten wie auf Seite . . . 19
10	$\overline{ED4}$	
11	$\overline{ED2}$	
12	$\overline{ED1}$	
18	$\overline{OUT\ R}$	

$\overline{OUT\ R}$ bedeutet, daß die Daten der Sammelschiene die ausgelesenen Daten mit „L"-Pegel sind.

Daten des Lesegerätes [READER] außer den oben aufgeführten

Stift	Symbol	
5	$\overline{FIELD}$	„H"-Pegel: 1. Halbbild; „L"-Pegel: 2. Halbbild
6	FWD	„H"-Pegel: FWD; „L"-Pegel: REW
7	$\overline{TMDL}$	„H"-Pegel: VITC wird ausgelesen; „L"-Pegel: alle übrigen

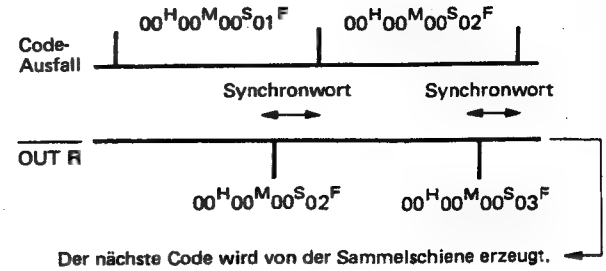
Eingangssignal des Lesegerätes [READER]

Stift	Symbol	
22	$\overline{FRM}$	CTL-Zählimpulseingang (Effizienz 50%)
23	$\overline{FD}$	Eingangsanschluß, wodurch der Zählimpuls von Stift [22 CTL] beim „H"-Pegel heruntergezählt und beim „L"-Pegel heraufgezählt wird.

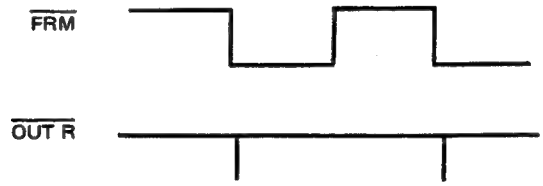
Dies kann in den folgenden Fällen benutzt werden:
Bei Gebrauch des Lesegerätes nur mit VITC
Bei Gebrauch des Lesegerätes als CTL-Zähler
Bei Gebrauch des Lesegerätes zum Herauf-/Herunterzählen

Die Ausgangsdaten des Lesegerätes [READER] und die Signale $\overline{OUT\ R}$ werden von der Sammelschiene mit der folgenden Zeitzählung erzeugt.

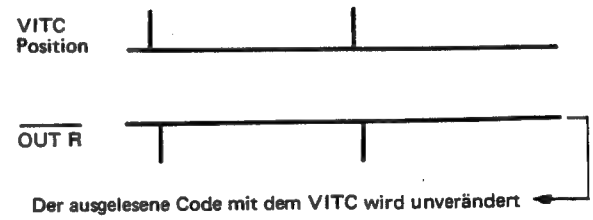
Beim Auslesen des Cue-Zeitcodes



Beim Zählen des CTL-Impulses



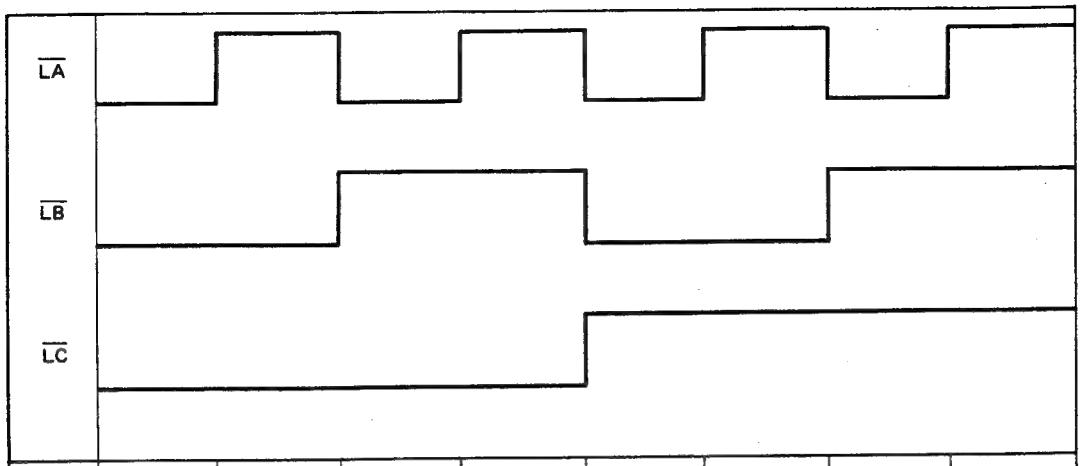
Beim Auslesen des VITC



1-7-3. Bezeichnung der Signale des Fernbedienungsanschlusses [REMOTE]

Stift	Symbol	Eingang/ Ausgang	Beschreibung
1			
2			
3			
4			
5			
6			
7			
8			
9	RMC	Ein Aus	Fernbedienungs-Schaltsignal von der Funktionsbedienungstafel REMOCON
10	+5V		Gleichspannung +5V
11	$\overline{\text{SW 1}}$	Ein Aus	Schaltsignale von der Funktionsbedienungstafel
12	$\overline{\text{PTT}}$	Ein Aus	
13	$\overline{\text{SW 3}}$	Ein Aus	
14	$\overline{\text{SW 2}}$	Ein Aus	
15	$\overline{\text{DS-2}}$	Aus	Anzeigesignale der Funktionsbedienungstafel
16	$\overline{\text{DS-1}}$	Aus	
17	$\overline{\text{DS-8}}$	Aus	
18	$\overline{\text{DS-4}}$	Aus	
19	$\overline{\text{LB}}$	Aus	Generator-Zeitsignale
20	$\overline{\text{LA}}$	Aus	
21	$\overline{\text{LAMP-1}}$	Aus	Funktionsbedienungstafel-Lampensignal
22	$\overline{\text{LC}}$	Aus	Generator-Zeitsignal
23	GND		
24	$\overline{\text{LAMP-2}}$	Aus	Funktionsbedienungstafel-Lampensignal
25	GND		

1-7-4. Schalter und Signale der Funktionsbedienungstafel



	Position	7	6	5	4	3	2	1	0	
	$\overline{DS\,1}$ $\overline{DS\,2}$ $\overline{DS\,4}$ $\overline{DS8}$	x10 Std. (UB-8)	x1 Std. (UB-7)	x10 Min. (UB-6)	x1 Min. (UB-5)	x10 Sec. (UB-4)	x1 Sec. (UB-3)	x10 VOLLBILD (UB-2)	x1 VOLLBILD (UB-1)	Klammern bedeuten U-BIT-Anzeige
H-Pegel L	$\overline{LAMP1}$ „leuchtet"				D4 REF	D7 LINE	D6 READER		D5 EXT CODE	
H L	$\overline{LAMP2}$ „leuchtet"	D11 VITC	D10 TC	D8 ERROR			D12 FIELD	D9 DROP FRAME		
H L *1	$\overline{PTT}$ SET	SW27 x10 Std. (UB-8)	SW26 x1 Std. (UB-7)	SW25 x10 Min. (UB-6)	SW24 x1 Min. (UB-5)	SW23 x10 Sek. (UB-4)	SW22 x1 Sek. (UB-3)	SW21 x10 Bilder (UB-2)	SW20 x1 Bilder (UB-1)	Klammern bedeuten U-BIT-HOLD-Anzeige
H L	$\overline{SW1}$		RUN READER HOLD			AUTO TC	VITC	ON ERROR BYPASS OFF	ON CHAR- ACTER OFF	
H L	$\overline{SW2}$		READER READER IN GENERATOR	ON READER THRU	VITC OFF	ON GENERATOR VITC OFF	VIDEO REF SYNC	SOURCE READER	SELECT REF	
H L	$\overline{SW3}$		RUN GENERATOR HOLD	NORMAL RESET	GENERATOR DISP READER	TIME DISP U-BIT	INT U-BIT THRU	EXT	ON DROP FRAME OFF	

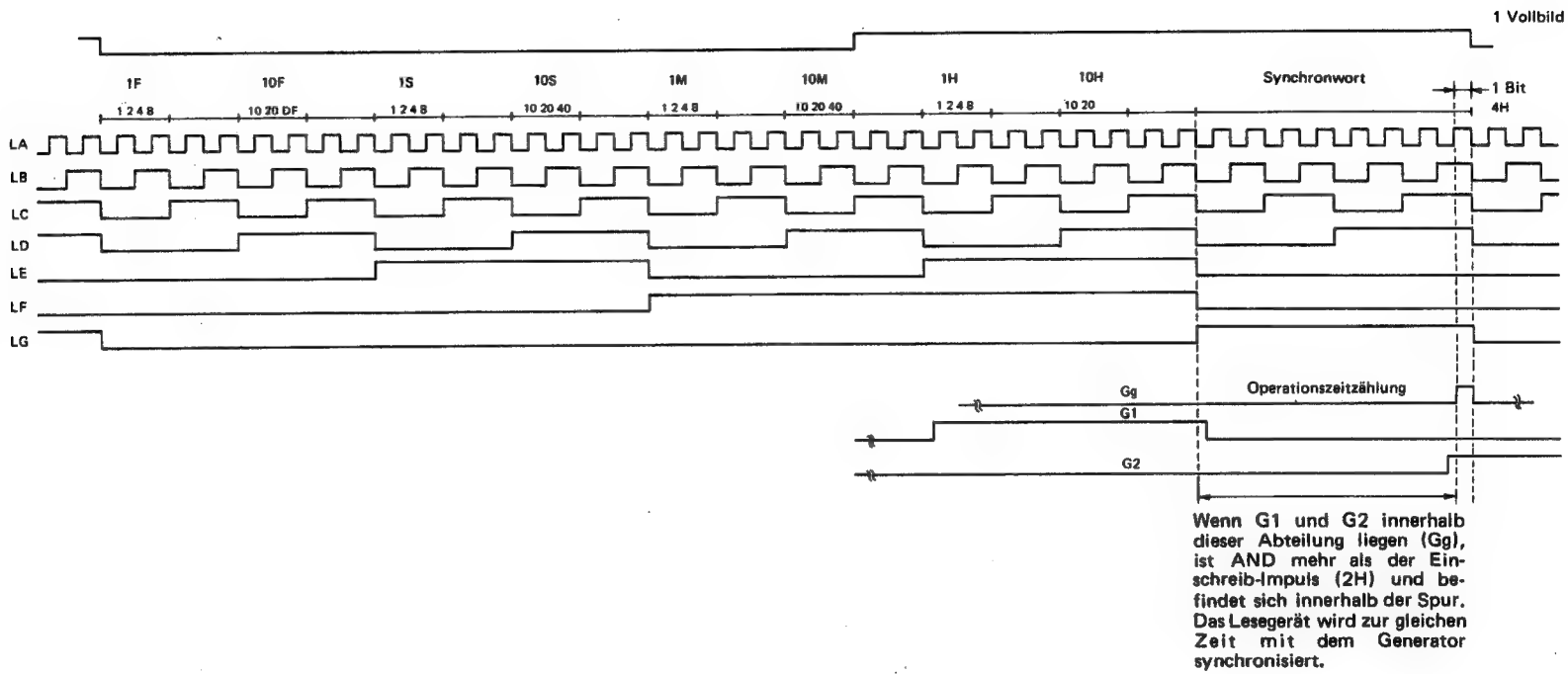
Gebrauch der Tabelle
Wenn von $\overline{LA}$, $\overline{LB}$ und $\overline{LC}$ eine spezifizierte Zeitzählung erzeugt wird, die Positionen 7 bis 0 angeben:
Beispiel 1: Wenn Position 6 des Anschlusses [$\overline{SW\,1}$] beim „L"-Pegel ist, bedeutet dies Halt des Lesegerätes.
Beispiel 2: Wenn die Positionen 5 und 4 des Anschlusses [$\overline{SW\,2}$] beide beim „H"-Pegel sind, bedeutet dies, daß der VITC des Lesegerätes eingeschaltet ist (ON).

*1 L-Pegel: SET

1-7-5. Zur besonderen Beachtung beim Gebrauch der Anschlüsse [DATA I/O] und [REMOTE]

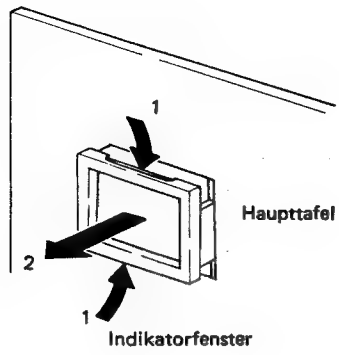
Die folgenden Punkte beim Gebrauch dieser Anschlüsse zur Ein-/Ausgabe von Daten beachten.

- Kein externes Signal an die Ausgangssignalanschlüsse anlegen. Außerdem einen 4700-Ohm-Widerstand an Vcc schalten.
- Die Signale mit der bestimmten Zeitzählung den Anschlüssen [DATA I/O] zuleiten.
  Zuleitung bei offenem Kollektor und dazwischengeschaltetem 4700-Ohm-Widerstand.
- Die bestimmten Signale den Eingangsanschlüssen zuleiten.
- Alle Signale haben TTL-Pegel. (FAN OUT 1)
- Die maximal mögliche Stromversorgung für den +5 V-Anschluß beträgt 300 mA.
  Daher, wenn möglich, eine externe Stromversorgung benutzen.
- Zum Anschluß verwenden Sie den D-Typ oder D-sub-Typ Stecker. (Siehe Seite 1-29.)

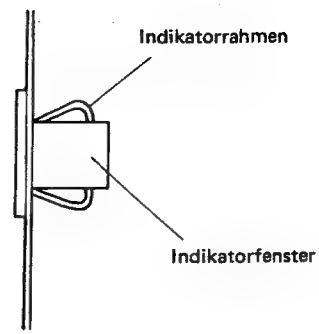

1 Vollbild
1F
10F
1S
10S
1M
10M
1H
10H
Synchronwort
1 Bit
4H
1 2 4 8
10 20 DF
1 2 4 8
10 20 40
1 2 4 8
10 20 40
1 2 4 8
10 20
LA
LB
LC
LD
LE
LF
LG
Gg
Operationszeitzählung
G1
G2
Wenn G1 und G2 innerhalb dieser Abteilung liegen (Gg), ist AND mehr als der Einschreib-Impuls (2H) und befindet sich innerhalb der Spur. Das Lesegerät wird zur gleichen Zeit mit dem Generator synchronisiert.

1-8. ANBRINGEN DES INDIKATORS

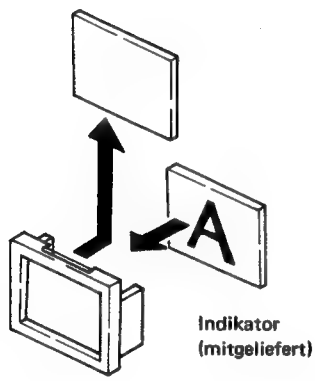
①



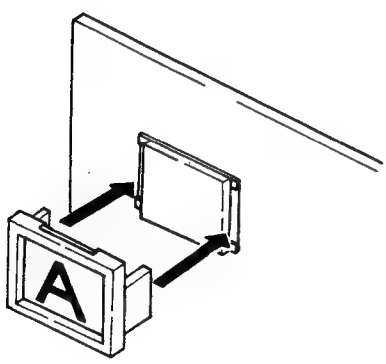
④



②



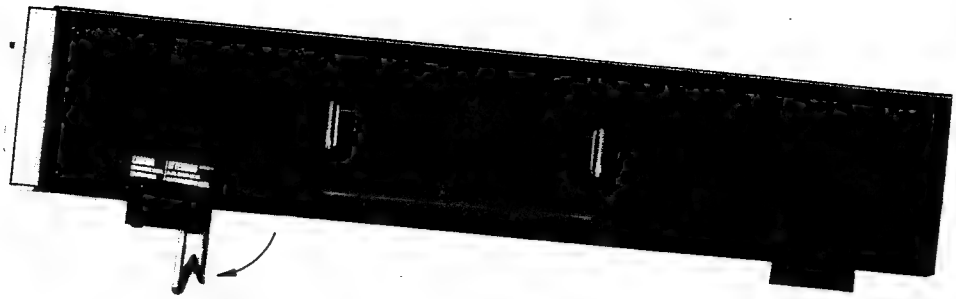
③



1	2	3	4	5
6	7	8	9	10
A	B	C	D	E
F	G	H	J	K

Für Studiosignalanzeige die Nummern und Buchstaben abziehen und verwenden.

1-9. TISCHAUFSTELLUNG

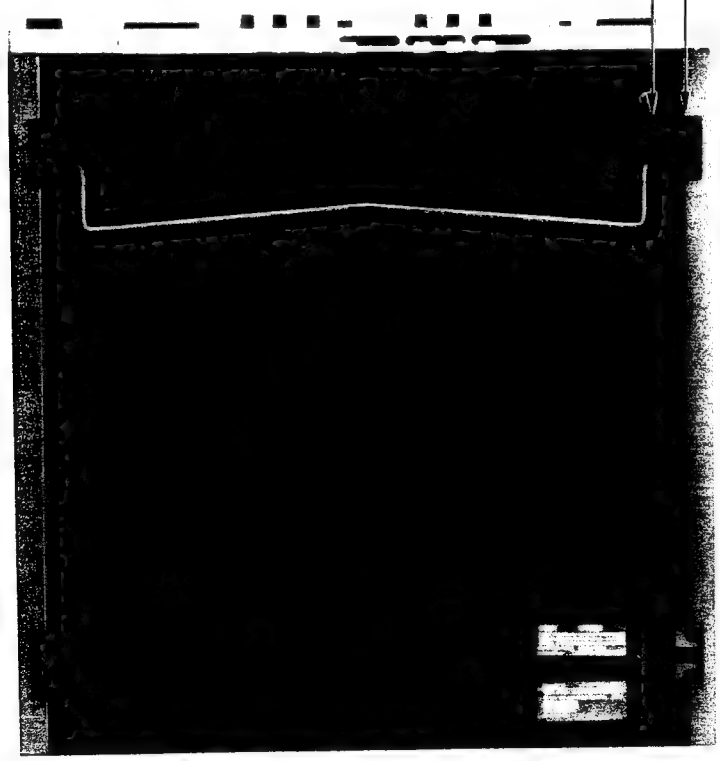


Schwenkfuß

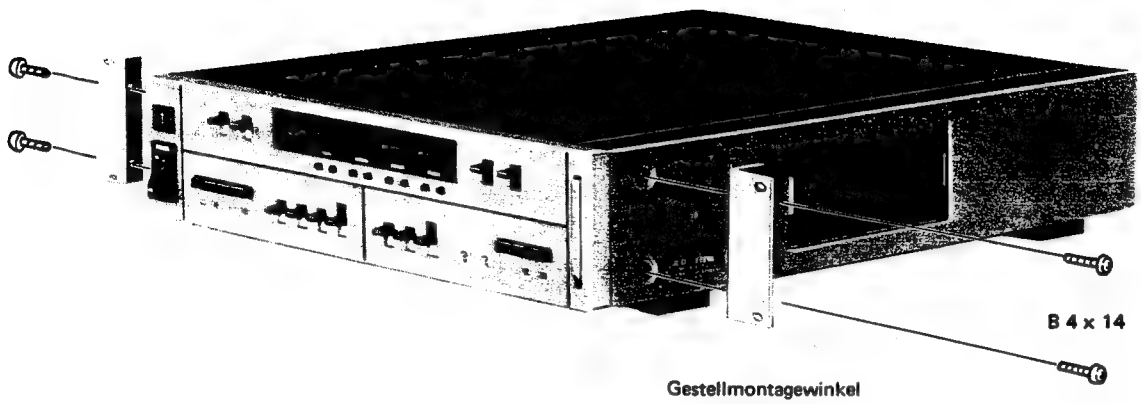
Bei Betrieb des Gerätes auf einem Tisch o. ä. den Schwenkfuß zu bequemer Bedienung herausziehen.

Bei Gestellmontage und zur Verringerung der Gerätehöhe die vier Füße abnehmen.

(Zum Abnehmen die Klammer drücken und schieben.)



1-10. ANBRINGEN DER GESTELLMONTAGEWINKEL

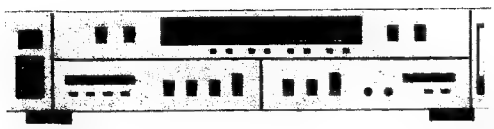


Gestellmontagewinkel

SONY

GENERATEUR DE CODE DE TEMPS/LECTEUR

BVG-1000



MODE D'EMPLOI ET D'ENTRETIEN

SECTION 1
FONCTIONNEMENT

1-1. CARACTERISTIQUES

Type universel

L'appareil peut être utilisé avec les systèmes de télévision NTSC, PAL ou SECAM et il émet et déchiffre non seulement les codes de temps longitudinals standards, mais aussi les codes de temps à intervalle vertical (VITC).

Le code de temps de sortie; le code de temps à intervalle vertical ou longitudinal, verrouille deux trames (une cadre). Une identification supplémentaire de quatre trames est requise pour un code de temps de verrouillage à quatre trames. Pour plus de détails, se reporter à la section 1-7-2.

Code de temps à intervalle vertical

En utilisant le code de temps longitudinal intérieur/extérieur, l'appareil peut ajouter un code de temps dans les intervalles vidéo verticaux. L'identification de cadre est alors possible à vitesse réduite, y compris l'image fixe.

Lecture précise

Quand les codes de temps SMPTE/EBU et VITC sont utilisés ensemble pour le fonctionnement de l'appareil, le code de temps peut être déchiffré précisément et affiché simultanément à partir de l'image fixe à l'avance rapide ou le rembobinage à n'importe quelle vitesse de bande (depuis la position fixe jusqu'à 128 fois la vitesse de bande normale, y compris l'avance et la marche arrière).

Générateur à caractères incorporé

L'appareil peut surimposer le code de temps sur l'écran du moniteur.

Fonction de verrouillage du code

L'appareil possède une caractéristique de verrouillage de code (extrapolation) avec l'entrée du code de temps standard SMPTE/EBU ou VITC.

Affichage des bits utilisateurs externes

Les bits du générateur ou du lecteur peuvent être affichés.

Possibilité de liaison avec un computer

Le connecteur [DATA I/O] peut être utilisé pour relier l'appareil avec un computer. (Données 4 bits, circuit parallèle)

Fonction de mémoire verrouillage/perte d'alimentation

L'appareil est équipé de fonctions qui permettent aux coupures momentanées d'alimentation et aux déviations de synchronisation d'être conservées dans la mémoire et affichées. Ceci signifie qu'il n'est pas nécessaire de contrôler la génération du code de temps.

Capacité de télécommande

Les fonctions du panneau des commandes de fonction et l'entrée et la sortie des données digitales peuvent toutes être contrôlées par télécommande.

Montage en rack

L'appareil peut être installé dans un rack de 19 pouces correspondant aux normes EIA.

1-2. SPECIFICATIONS

1-2-1. Spécifications électriques

Entrée du code de temps	0,5 à 10 V c.- c. 600/3 kohms, équilibrée 0,15 à 2,2 V c.- c. 75 ohms, non équilibré
Sortie du code de temps	0 à +8 dBm (regl. INT) 600 ohms équilibré
Entrée vidéo	1 V c.- c. 75 ohms perte de retour −36 dB
Sortie vidéo	1 V c.- c. 75 ohms
Linéarité	1%
DG	1%
DP	1°
Facteur K	1% (pulsion 2T)
Réponse en fréquence	30 Hz à 6 MHz ±0,2 dB
Rapport signal sur bruit	60 dB c.-c. signal à bruit efficace (100 kHz-fg RES)
Inclinaison	1,5%

GENERATEUR VITC

Amplitude du code de temps chiffré	80 ± 10 unités IRE
Position	Ligne 10 – 26
Rythme bit	113,75 fH kb/s fH ⟶ kHz

GAMME DE LECTURE DU CODE DE TEMPS

Gamme de lecture totale	Image fixe à 128 fois en avance et marche arrière En mode automatique: code de temps VITC et SMPTE/EBU standard automatiquement activés (piste longitudinale)
Gamme de lecture VITC	Image fixe à 2 fois en avance et marche arrière
Gamme de lecture de la piste longitudinale	$^{1}/_{16}$ à 128 fois en avance et marche arrière
ALIMENTATION	Secteur 100/120/220/240 V (réglable) 48 à 64 Hz
CONSOMMATION	100 W

1-2-2. Spécifications mécaniques

CONNECTEURS

Data I/O	25 broches, sous-type D Femelle*
Remote	25 broches, sous-type D Mâle*

Section générateur

Sortie code de temps	3 broches XLR
Entrée code de temps	3 broches XLR
Entrée synchronisation	BNC x2 par boucle W/75 ohms ON/OFF
Sortie vidéo W/VITC	BNC
Entrée vidéo	BNC } par boucle W/75 ohms
Retour	BNC } ON/OFF

Section magnétoscope

Sortie code de temps	3 broches XLR
Entrée code de temps	3 broches XLR
Sortie vidéo W/VITC	BNC
Sortie vidéo W/caractère	BNC
Entrée vidéo	BNC } par boucle W/75 ohms
Retour	BNC } ON/OFF

DIMENSIONS 424 (l) x 88 (h) x 446 (p) mm

POIDS Env. 13 kg (28,6 livres)

ACCESSOIRES

Indicateur télécommande	1 jeu
Fixations de montage du rack	1 jeu
Fusible	1
Couvercle	1
Plaque d'extension	1

* Les connecteurs [REMOTE] et [DATA I/O] sont de type D ou du sous-type D. Pour obtenir une fiche de branchement compatible avec ces connecteurs, interroger un fabricant de connecteur. Les numéros de modèles des fiches compatibles sont les suivants:

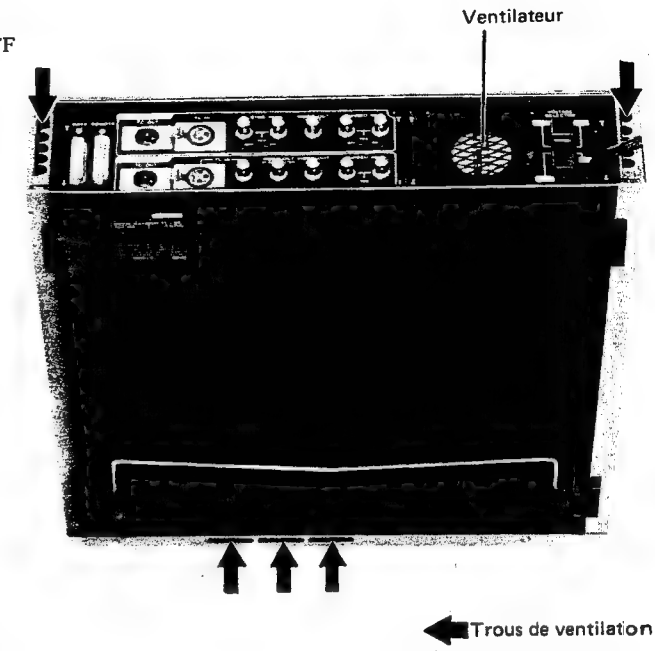
Pour le connecteur [DATA I/O]: D-25-P avec ensemble coquille

Pour le connecteur [REMOTE] : D-25-S avec ensemble coquille

Les vis de verrouillage du BVG-1000 ont un pas de vis métrique (3 mm de diamètre pour les anciens modèles et 2,6 mm pour le modèle actuel). Si les vis de verrouillage de la fiche utilisée ont un pas de vis calculé en pouces, remplacer les vis de verrouillage du BVG-1000 par des pièces ayant un pas de vis équivalent en pouces.

1-3. PRECAUTIONS A PRENDRE AVANT L'UTILISATION

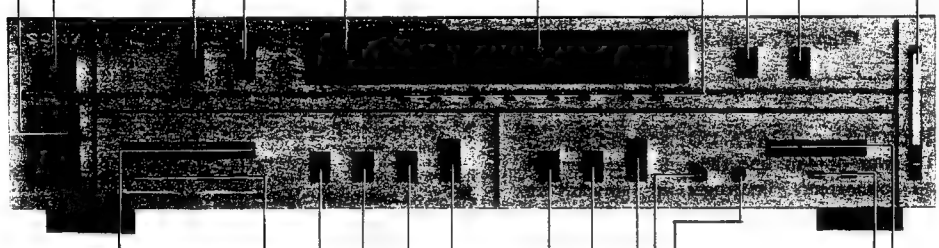
- Vérifier que l'appareil est utilisé sous température ambiante comprise entre 0°C et 40°C.
- Ne pas l'utiliser près de source de chaleur.
- Ne pas bloquer le ventilateur ni les trous de ventilation (voir la photo suivante).



- Laisser un espace d'au moins 30 cm entre le panneau arrière et le mur ou toute autre surface.
- Toujours refermer le panneau des commandes de fonction après les réglages internes.
- Laisser l'appareil chauffer pendant environ 15 minutes avant de l'utiliser.

1-4. DESCRIPTION DES ELEMENTS ET DES COMMANDES

1-4-1. Panneau des commandes de fonction



SECTION COMMUNE

① Interrupteur d'alimentation [POWER]
② Indicateur de télécommande
③ Interrupteur de sélection d'affichage [DISPLAY SELECT] (GENERATEUR/LECTEUR)
④ Interrupteur de sélection d'affichage [DISPLAY SELECT] (CODE DE TEMPS/U-BIT)
⑤ Indicateur d'affichage [DISPLAY]
⑥ Affichage numérique
⑦ Interrupteurs de réglage [SET]
⑧ Interrupteur de maintien [HOLD]
⑨ Interrupteur de remise à zéro [RESET]
⑩ Levier de déverrouillage

SECTION GENERATEUR

⑪ Touches de sélection de source [SOURCE SELECT]
⑫ Indicateurs de verrouillage [LOCK]
⑬ Interrupteur du sélecteur de référence [REF]
⑭ Interrupteur de génération de code de temps VITC [VITC ON/OFF]
⑮ Interrupteur de diminution d'image [DROP FRAME ON/OFF]
⑯ Interrupteur du sélecteur bits utilisateurs [U-BIT]

SECTION LECTEUR

⑰ Interrupteur chiffres [CHARACTER ON/OFF]
⑱ Interrupteur de découplage d'erreur [ERROR BYPASS ON/OFF]
⑲ Interrupteur de lecture de code de temps VITC [VITC]
⑳ Indicateur d'erreur [ERROR]
㉑ Indicateur de diminution d'image [DROP FRAME]
㉒ Touches de sélection d'entrée [INPUT SELECT]
㉓ Indicateurs de sélecteur d'entrée [INPUT SELECT]

SECTION COMMUNE

① **Interrupteur d'alimentation [POWER]**

② **Indicateur de télécommande**
Il s'allume quand le modèle est commandé par télécommande.

③ **Interrupteur de sélection d'affichage [DISPLAY SELECT] (Générateur/lecteur)**
GENERATOR: L'indication "GENERATOR" de l'indicateur [DISPLAY] s'allume pour indiquer qu'une sortie du générateur est en cours d'affichage.
READER: L'indication "READER" de l'indicateur [DISPLAY] s'allume pour indiquer qu'une entrée du lecteur est en cours d'affichage.

④ **Interrupteur de sélection d'affichage [DISPLAY SELECT] (Code de temps/U-bit)**
TIME CODE: L'affichage est réglé sur le code de temps.
U-BIT: L'affichage est réglé sur les bits utilisateurs.

⑤ **Indicateur d'affichage [DISPLAY]**
Il est divisé en deux parties: l'une pour indiquer que la sortie du générateur est affichée, et l'autre pour indiquer que c'est l'entrée du lecteur qui est affichée.

⑥ **Affichage numérique**
Il affiche le code de temps ou les bits utilisateurs en 8 chiffres. La trame (paire ou impaire) est également affichée avec le code de temps.
- La trame est indiquée par diode électroluminescente (LED) pour le chiffre le plus à droite, et pour l'indication du lecteur uniquement, quelle que soit la position de l'interrupteur de sélection d'affichage [DISPLAY SELECT].
- Les symboles suivants sont affichés pour les bits utilisateurs quand les données sont basées sur une notation hexadécimale allant de A à F:
  A →⊏ , B →⊐ , C →⊔ , D →⊑ , E →⊏ , F →pas d'affichage.

⑦ **Interrupteurs de réglage [SET]**
Ils sont utilisés pour régler la valeur initiale du code de temps de la sortie du générateur ou les bits spécifiques des bits utilisateurs. Avant le réglage, mettre l'affichage numérique sur GENERATOR puis sélectionner/maintenir le code de temps ou les bits utilisateurs.

⑧ **Interrupteur de maintien [HOLD]**
Il est utilisé pour maintenir le générateur ou le lecteur.
Quand l'interrupteur est réglé, un point apparaît à gauche sous chaque chiffre de l'affichage. (Ces points s'allument.)
Cet interrupteur peut être utilisé en conjonction avec l'interrupteur momentané pour répéter l'opération de maintien et pour relâcher l'opération de maintien. Si le générateur (ou le lecteur) est maintenu et si l'affichage numérique est commuté sur le lecteur (ou le générateur), le générateur (ou le lecteur) qui est maintenu, est relâché.

⑨ **Interrupteur de remise à zéro (interrupteur momentané) [RESET]**
Quand le générateur est maintenu, tous les chiffres sont remis à zéro si on enfonce cet interrupteur.

⑩ **Levier de déverrouillage**
Pousser le bas du levier, le basculer et le tirer en avant. Il est alors possible d'ouvrir le panneau des commandes de fonction vers la gauche.

SECTION GENERATEUR

⑪ **Touches de sélection de source [SOURCE SELECT]**
Elles sont utilisées pour sélectionner la source sur laquelle est basée le code de temps du générateur.
REF: quand la fonction de maintien du générateur est relâchée, le signal vidéo ou le signal de synchronisation connecté aux connecteurs [VIDEO IN] ⑧ ou [SYNC IN] ⑤ du panneau de connexions est référencié et avancé.
EXT CODE: Cette touche permet de rendre le code de temps connecté au connecteur [TIME CODE IN] ④ du panneau de connexions comme une sortie référenciée et échantillonnée.
READER: Cette touche permet d'utiliser le VITC (signal sélectionné par les touches [INPUT SELECT]) ou le code de temps connecté aux connecteurs [TIME CODE IN] ⑩ du panneau de connexions comme une source référenciée et échantillonnée.
- Sous des conditions de fonctionnement normales, il est nécessaire de synchroniser le code de temps ou les signaux d'entrée VITC et les signaux de référence.

LINE: Quand la fonction de maintien du générateur est relâchée, la fréquence du secteur est référenciée et avancée.
- Les fréquences du secteur différentes sont automatiquement détectées (50 ou 60 Hz) et le code de temps SMPTE ou EBU est alors généré.
- La fréquence du secteur est automatiquement verrouillée quand il n'y a pas de signaux de référence fournis.

⑫ **Indicateurs de verrouillage [LOCK]**
Quand le circuit de verrouillage de phases en boucles (PLL) du générateur se verrouille sur les signaux sélectionnés au moyen des touches [SOURCE SELECT], l'indicateur à LED correspondant s'allume.

⑬ **Interrupteur du sélecteur de référence [REF]**
VIDEO: Quand la touche de sélection de source de référence [REF SOURCE SELECT] est enfoncée, les signaux vidéo sont disponibles comme signaux de référence.
SYNC: Quand la touche [REF SOURCE SELECT] est enfoncée, les signaux de synchronisation sont disponibles comme signaux de référence.
- Quand on laisse cet interrupteur sur SYNC, le code de temps ou les bits utilisateurs resteront stables, même si les signaux vidéo de base connectés aux connecteurs [TIME CODE IN] ⑩ du panneau de connexions sont désynchronisés quand le générateur à chiffre du lecteur est utilisé et le code de temps ou les bits utilisateurs sont surimposés sur l'écran du moniteur.
  (Ceci signifie que le code de temps ou les bits utilisateurs resteront stables au même emplacement sur l'écran du moniteur.)

⑭ **Interrupteur de générateur de code de temps VITC [VITC ON/OFF]**

ON: Quand l'interrupteur du sélecteur [REF] ⑬ est placé sur VIDEO, le code VITC est ajouté aux signaux vidéo connectés au générateur.

OFF: Le code VITC est mis hors fonction.

- Quand l'interrupteur du sélecteur [REF] ⑬ est placé sur SYNC, la position VITC est basée sur SYNC.
- Sous des conditions de fonctionnement normales, les signaux vidéo et de synchronisation doivent être verrouillés.
- Quand la touche [LINE SOURCE SELECT] a été enfoncée, le code de temps est soumis à un fonctionnement anormal et la valeur échantillonnée par la ligne, est ajoutée au VITC.

⑮ **Interrupteur de diminution d'image [DROP FRAME ON/OFF]**

ON: Le modèle est réglé sur le mode de diminution d'image quand le code de temps SMPTE et le VITC sont émis pour les signaux NTSC.

OFF: Pas de fonction de diminution d'image.

Avec un code de temps EBU, l'interrupteur peut être mis sur ON ou OFF, puisque cela n'entraîne pas de changement. Cependant, l'interrupteur [SECAM/PAL/NTSC] de la plaquette VIDEO PC doit être réglé soit sur la position SECAM, soit sur la position PAL.

⑯ **Interrupteur du sélecteur bits utilisateurs [U-BIT]**

THRU: Quand la touche [READER] ou [EXT CODE SOURCE SELECT] est enfoncée, les données du lecteur sont disponibles comme bits utilisateurs.
Avec entrée directe au circuit du connecteur [DATA I/O] ① du panneau de connexions, les données sont disponibles comme bits utilisateurs.

- Quand il n'y a pas d'entrée à partir du lecteur et du connecteur [DATA I/O], les bits utilisateurs sont émis par le générateur.

INT: Les bits utilisateurs sont émis par le générateur.

EXT: Les bits utilisateurs sont émis par l'entrée en provenance du connecteur [DATA I/O] ① du panneau du connecteur.
Quand il n'y a pas d'entrée au connecteur [DATA I/O], les bits utilisateurs sont émis par les données au côté du lecteur.

- Quand il n'y a pas de lecteur ni d'entrée au connecteur [DATA I/O], les bits utilisateurs sont émis par le générateur.

SECTION LECTEUR

⑰ **Interrupteur chiffres [CHARACTER ON/OFF]**

ON: En utilisant le générateur chiffres, le code de temps ou les bits utilisateurs peuvent être surimposés sur les signaux vidéo connectés au lecteur. Quand le code de temps ou les bits sont déchiffrés par le lecteur, la surimpression peut être visionnée sur l'écran du moniteur.

- Si l'interrupteur du sélecteur [REF] ⑬ est placé sur SYNC avec une entrée de synchronisation, les chiffres surimpressionnés resteront stables même si la vitesse de la bande vidéo fluctue.
- Les symboles suivants sont affichés pour les bits utilisateurs quand les données sont basées sur une notation hexadécimale allant de A à F.
  A→ : , B→ ; , C→ < , D→ = , E→ > , F→ ?

⑱ **Interrupteur de découplage d'erreur [ERROR BYPASS ON/OFF]**

ON: Le circuit de découplage d'erreur est activé.
La longueur du découplage d'erreur peut être sélectionnée jusqu'à un maximum de 15 images en utilisant l'interrupteur de la plaque de circuit imprimé.

OFF: Le circuit de découplage d'erreur est désactivé.

⑲ **Interrupteur de lecture de code de temps VITC [VITC]**

THRU: Les signaux vidéo connectés au lecteur sont renvoyés sans être traités, et sans que l'information VITC n'ait été ajoutée.

ON: Mettre l'interrupteur sur cette position pour ajouter le code VITC aux signaux vidéo ou pour remplacer le VITC précédemment ajouté par une nouvelle valeur.
Quand le code VITC est ajouté aux signaux vidéo connectés au lecteur, le code de temps déchiffré par le lecteur est codé dans le code VITC et ajouté ensuite.

- Le code VITC précédemment ajouté peut être remplacé par une nouvelle valeur quand la position du VITC précédent (les 3 lignes de l'intervalle vertical occupé par le code) et celle du nouveau VITC sont identiques.
  Les 3 lignes qui doivent être occupées par l'insertion VITC peuvent être sélectionnées en utilisant l'interrupteur de la plaquette de circuit imprimé.
  (Il est préférable que l'information VITC soit insérée dans les périodes actives des lignes 12, 13 et 14 pour chacune des trames avec le système NTSC.)

OFF: Mettre l'interrupteur sur cette position quand on n'insère ou ne retire pas les signaux VITC.

- Comme indiqué dans la description de la position ON, les positions VITC doivent être identiques quand on retire l'ancien VITC.

⑳ **Indicateur d'erreur [ERROR]**

Il s'allume pour indiquer qu'une erreur du code de temps a été détectée pendant le déchiffrage. Cet indicateur s'allume, quelle que soit la position de l'interrupteur [ERROR BYPASS ON/OFF]. L'affichage indique la valeur correcte dans la limite du découplage d'erreur (quand l'interrupteur [ERROR BYPASS ON/OFF] est sur ON).

㉑ **Interrupteur de diminution d'image [DROP FRAME]**

Il s'allume quand le code de temps est réglé sur le mode de diminution d'image quand le code de temps SMPTE et VITC sont déchiffrés avec considération des signaux NTSC.

㉒ **Touches de sélection d'entrée [INPUT SELECT]**

AUTO: Le code de temps SMPTE/EBU est déchiffré automatiquement quand la bande défile à plus de la moitié de la vitesse de lecture normale.
Le code VITC est déchiffré quand la bande défile à moins de la moitié de la vitesse de lecture normale.

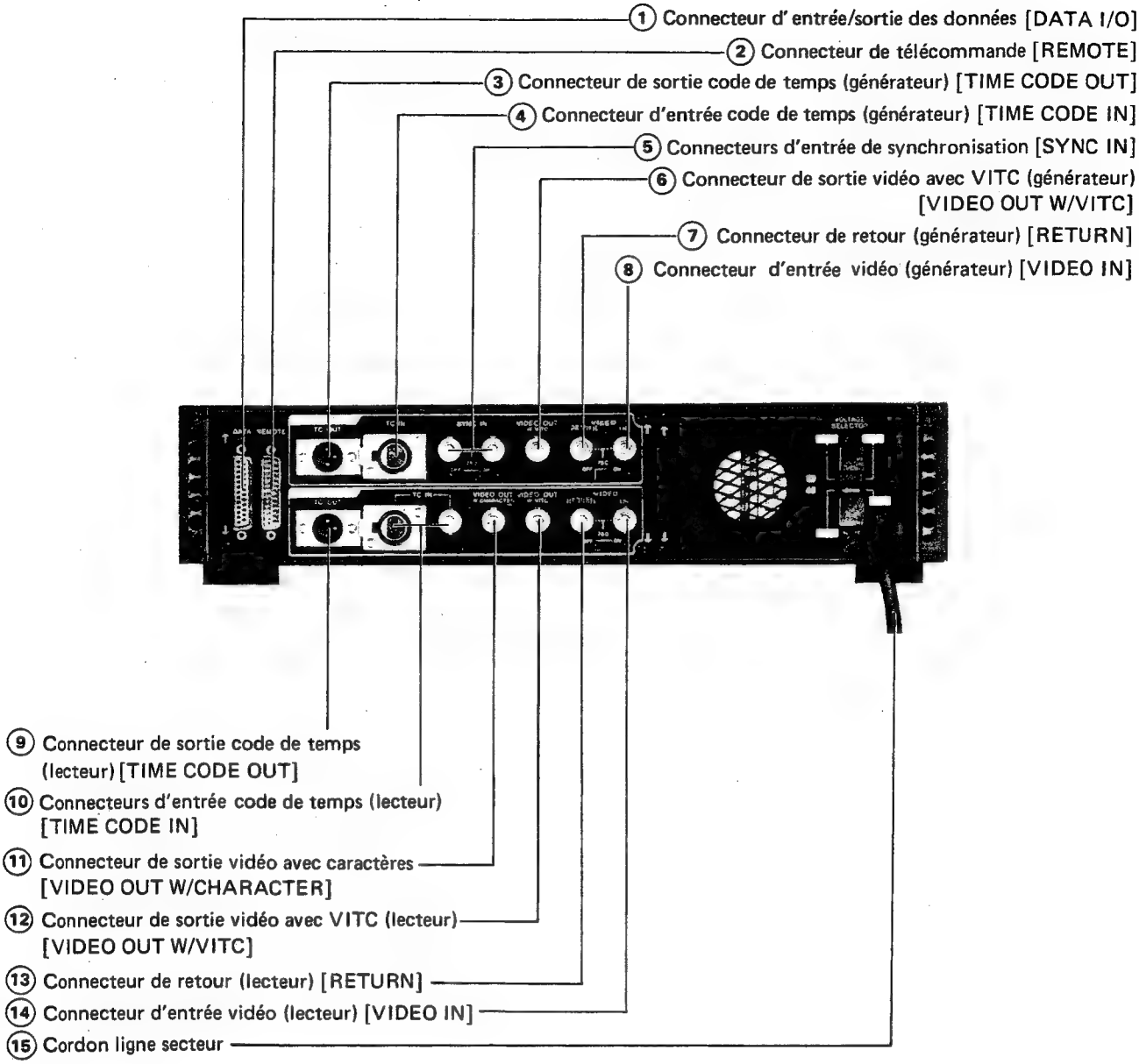
TC: Enfoncer cette touche pour déchiffrer le code de temps SMPTE/EBU quand la bande défile de 1/16 à 128 fois la vitesse de lecture normale.

VITC: Enfoncer cette touche pour déchiffrer le VITC quand la bande défile de 0 à deux fois la vitesse de lecture normale.

㉓ **Indicateurs de sélection d'entrée [INPUT SELECT]**

Quand la touche [AUTO INPUT SELECT] est enfoncée, l'indicateur [TC] ou [VITC] situé sous les touches [INPUT SELECT] s'allume pour indiquer le type de code de temps qui est déchiffré par le lecteur.

1-4-2. Panneau de connexions



① **Connecteur d'entrée/sortie des données [DATA I/O]**
Connecteur d'entrée/sortie pour les données du générateur/lecteur et les signaux chronométrage.
Circuit commun parallèle à données de 4 bits (pour plus de détails, se reporter au matériel indiqué plus loin).

② **Connecteur de télécommande [REMOTE]**
Utilisé pour permettre aux fonctions du panneau des commandes de fonction d'être contrôlées par télécommande.

③ **Connecteur de sortie code de temps (générateur) [TIME CODE OUT]**
Impédance de charge: 600 ohms.
Connecteur de sortie pour le code de temps longitudinal émis par le générateur.

④ **Connecteur d'entrée code de temps (générateur) [TIME CODE IN]**
Impédance d'entrée: 600/3 kohms (peut être sélectionnée sur la plaquette de circuit imprimé)
Connecteur d'entrée pour verrouillage du générateur de l'appareil sur un code de temps SMPTE/EBU.
Le code de temps d'entrée possède un même niveau de bits que celui de la lecture normale.

⑤ **Connecteurs d'entrée de synchronisation [SYNC IN]**
Connecteur d'entrée de synchronisation extérieure, sortie en pont, résistance de terminaison ON/OFF.
En utilisant les commandes du panneau des commandes de fonction et en mettant l'appareil sur le verrouillage de synchronisation extérieure, le code de temps du générateur et le circuit de génération des chiffres du lecteur sont pratiquement inaffectés par le bruit.

⑥ **Connecteur de sortie vidéo avec VITC (générateur) [VIDEO OUT W/VITC]**
Ceci produit le signal vidéo provenant du connecteur [VIDEO IN] ⑧ auquel le code de temps VITC est ajouté. Quand le signal d'entrée porte un VITC, ce connecteur produit un signal dont le VITC a été remplacé par un nouveau VITC du générateur. Dans ce cas, les interrupteurs [POSITION] ⑥ et [WIDTH] ⑦ de la plaquette de circuit imprimé devront être réglés pour couvrir les lignes sur lesquelles le signal vidéo d'entrée porte le VITC.

⑦ **Connecteur de retour (générateur) [RETURN]**

⑧ **Connecteur d'entrée vidéo (générateur) [VIDEO IN]**
Pour être connecté en pont avec le connecteur [RETURN] ⑦, résistance de terminaison ON/OFF.
Signaux vidéo connectés à ces connecteurs, servent de référence pour le générateur.
Connecter les signaux vidéo à ces connecteurs au moment voulu pour ajouter VITC à ces signaux. Faire sortir les signaux du connecteur [VIDEO OUT W/VITC] ⑥.

⑨ **Connecteur de sortie code de temps (lecteur)**
Impédance de charge: 600 ohms.
Ceci produit le code de temps longitudinal qui est régénéré, soit à partir du code de temps SMPTE/EBU émis par le connecteur [TIME CODE IN] ④, soit par le VITC émis par le connecteur [VIDEO IN] ⑧.
La fonction de régénération peut être sélectionnée par l'interrupteur de la plaquette de circuit imprimé comme suit:
a) Le code de temps déchiffré par le lecteur est remplacé par le taux de bits de lecture normale puis sorti. (Le minutage est exactement identique à celui du générateur.)
b) Les formes d'onde du code de temps d'entrée sont formées et sorties.

⑩ **Connecteurs d'entrée code de temps (lecteur)**
600/3 kohms, (sélectionnable sur la plaquette de circuit imprimé), équilibré.
75 ohms, non équilibré.
Deux connecteurs d'entrée (équilibré et non équilibré) sont fournis, mais ne peuvent être utilisés simultanément.
L'entrée non équilibrée possède une largeur de gamme plus grande que l'entrée équilibrée.

⑪ **Connecteur de sortie vidéo avec caractères [VIDEO OUT W/CHARACTER]**
Ceci produit le même signal que la sortie du connecteur [VIDEO OUT VITC/W] ⑫, avec les caractères du code de temps de lecture surimposé sur l'image. Normalement, les signaux de sortie en provenance de ce connecteur sont utilisés pour contrôle, mais on peut également les utiliser pour une copie de montage autonome.
Les caractères seront "brûlés" dans l'image quand le signal est enregistré. (La position, la largeur, la hauteur sont sélectionnables intérieurement.)
Des parasites peuvent être observées autour des caractères avec les signaux SECAM, ce qui fait que ceux-ci ne sont utilisés que pour le contrôle).

⑫ **Connecteur de sortie vidéo avec VITC (lecteur) [VIDEO OUT W/VITC]**
Ceci produit le signal vidéo à partir du connecteur [VIDEO IN] ⑭ avec le VITC qui est codé à partir de la lecture du code de temps SMPTE/EBU du lecteur.
Lorsque le signal qui arrive porte un VITC, ce connecteur produit également le signal dont le VITC a remplacé. Dans ce cas, les interrupteurs [POSITION] ⑥ et [WIDTH] ⑦ de la plaquette de circuit imprimé devront être réglés pour couvrir les lignes sur lesquelles le signal vidéo d'entrée porte le VITC.

⑬ **Connecteur de retour (lecteur) [RETURN]**

⑭ **Connecteur d'entrée vidéo (lecteur) [VIDEO IN]**
Pour être connecté en pont avec le connecteur [RETURN] ⑬, résistance de terminaison ON/OFF.
Connecteurs d'entrée pour les signaux vidéo d'un VTR ou d'un équipement similaire.
Le VITC dans les signaux vidéo peut être déchiffré par le lecteur.
Les signaux d'entrée vidéo sont disponibles sur les connecteurs [VIDEO OUT W/CHARACTER] ⑪ et [VIDEO OUT W/VITC] ⑫.

1-4-3. Précautions pour les connexions

Les connecteurs [RETURN] ⑦ ⑬ et [VIDEO IN] ⑧ ⑭ de même que les connecteurs [SYNC IN] ⑤ ont une configuration en connexions par boucle et peuvent être connectés en pont.

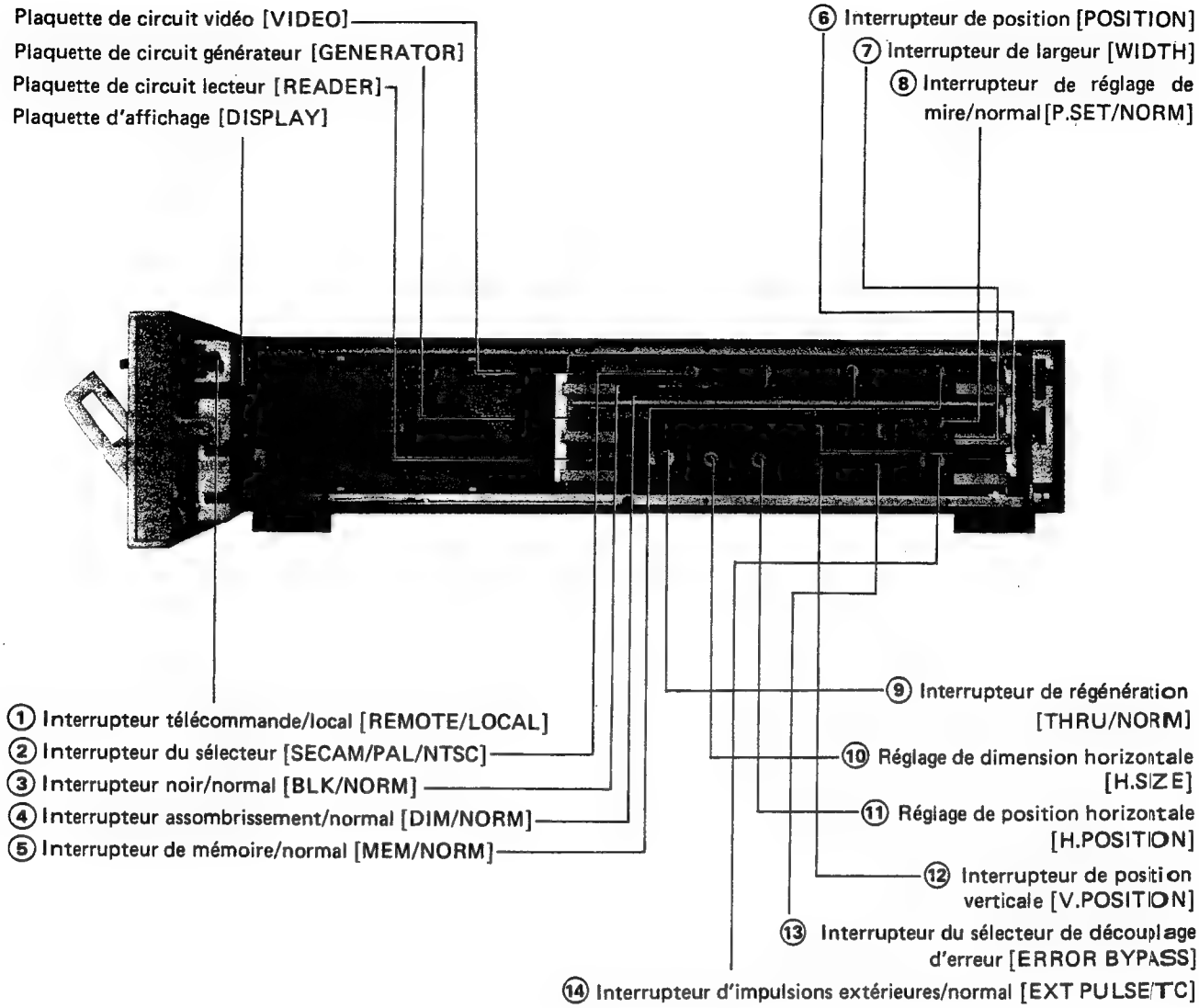
Par conséquent, toujours vérifier les positions ON/OFF des résistances des terminaison de 75 ohms des connecteurs.

Cet appareil est conçu de sorte que lorsque l'alimentation est coupée, les signaux en provenance des connecteurs [VIDEO OUT W/VITC] ⑥ et ⑫ ne sont pas coupés; il est donc nécessaire de se souvenir des points suivants lors des connexions, y compris lors des connexions en pont mentionnées plus haut.

- **Quand l'alimentation est coupée avec les résistances de terminaison des connecteurs [RETURN] et [VIDEO IN] sur ON:**
Le connecteur [VIDEO IN] est connecté aux connecteurs [RETURN] et [VIDEO OUT]; en même temps, le circuit interne, y compris les résistances de terminaison, est coupé.
La source de signal qui était connectée au connecteur [VIDEO IN] est terminée avec la charge qui était connectée aux connecteurs [VIDEO OUT].

- **Quand l'alimentation est coupée avec les résistances de terminaison des connecteurs [RETURN] et [VIDEO IN] sur OFF:**
Le connecteur [VIDEO IN] est relié aux connecteurs [VIDEO OUT]. En même temps, le circuit interne, y compris le [RETURN] et les résistances de terminaison, est coupé.
La source de signal qui était connectée au connecteur [VIDEO IN] est terminée par la charge qui était connectée aux connecteurs [VIDEO OUT].

1-4-4. Plaquettes de circuit imprimé



- Tous les interrupteurs à glissière sont placés sur leur position droite pour le fonctionnement normal.

Plaquette d'affichage [DISPLAY]

① **Interrupteur télécommande/local [REMOTE/LOCAL]**

REMOTE: Mettre l'interrupteur sur sa position supérieure. L'indicateur de télécommande du panneau des commandes de fonction s'allume et les commandes du panneau des commandes de fonction ne fonctionnent plus.

LOCAL: L'appareil peut être utilisé normalement avec les commandes du panneau des commandes de fonction.

Plaquette de circuit vidéo [VIDEO]

② **Interrupteur du sélecteur [SECAM/PAL/NTSC]**

SECAM: pour les signaux vidéo SECAM.

PAL: pour les signaux vidéo PAL.

NTSC: pour les signaux vidéo NTSC.

③ **Interrupteur noir/normal [BLK/NORM]**

BLK: Les signaux vidéo entrant dans le générateur peuvent être transformés en impulsions noires et sortis. La couleur est ajoutée quand les signaux SECAM sont fournis.

NORM: pour le fonctionnement normal (position droite).

④ **Interrupteur d'assombrissement/normal [DIM/NORM]**

DIM: L'éclairage des deux premiers caractères (10H et H) de l'affichage numérique aussi bien que les deux derniers caractères (10F et F) peut être réduit.

NORM: pour le fonctionnement normal (position droite).

⑤ **Interrupteur de mémoire/normal [MEM/NORM]**

MEM: L'alimentation est momentanément coupée et les perturbances de synchronisation sont mémorisés.

Verrouillage perdu ⟶ l'indicateur [LOCK] clignote.

Alimentation perdue ⟶ l'indicateur [LOCK] et l'affichage numérique clignotent.

Mettre l'interrupteur sur NORM pour régler de nouveau l'indication clignotante. Mettre l'interrupteur d'alimentation [POWER] sur ON puis régler cet interrupteur sur MEM pour activer les fonctions de verrouillage et d'alimentation perdus.

NORM: Pour le fonctionnement normal (position droite) et pour régler de nouveau, comme indiqué plus haut.

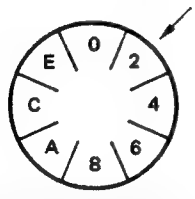
Plaquette de circuit générateur [GENERATOR]

⑥ **Interrupteur de position**

L'utiliser pour déterminer dans quelle ligne le signal VITC doit être inséré. (Commun au générateur/lecteur)

Le laisser sur '2' pour les signaux NTSC.

2 : ligne 12



⑦ **Interrupteur de largeur [WIDTH]**

Il est utilisé pour déterminer combien de lignes doivent être étendues avec le signal VITC. (Commun au générateur/lecteur)

Le laisser sur '3' pour les signaux NTSC.

⑧ **Interrupteur de réglage de mire/normal [P.SET/NORM]**

THRU: Si l'interrupteur est sur cette position pour l'assemblage du code de temps SMPTE/EBU (verrouillage-code), les connexions peuvent se faire avec le niveau de mire magnétique sur la bande. Pour la compensation, le bit 63 (le plus élevé des bits utilisateurs) est utilisé comme bit de parité.

NORM: Le laisser normalement sur cette position (réglage à droite) pour permettre à tous les bits utilisateurs d'être utilisés librement.

Plaquette de circuit lecteur [READER]

⑨ **Interrupteur de régénération [THRU/NORM]**

THRU: Les formes d'onde des signaux de code de temps entrées dans le lecteur, sont formées et sorties. Le taux de bits du signal de sortie change selon le signal d'entrée.

NORM: Le code de temps de lecture normale entré dans le lecteur est régénéré, formé et sorti avec le même minutage que celui du générateur. Il n'y a pas de détérioration des formes d'onde quand les signaux de sortie sont utilisés pendant le repiquage (en mode de lecture normale).

⑩ **Réglage de dimension horizontale [H.SIZE]**

Pour régler les dimensions horizontales des chiffres surimposés par le lecteur.

⑪ **Réglage de position horizontale [H.POSITION]**

Utilisé pour régler la position horizontale des chiffres surimposés par le lecteur.

⑫ **Interrupteur de position verticale [V.POSITION]**

Utilisé pour régler la position verticale des chiffres surimposés par le lecteur.

⑬ **Interrupteur du sélecteur de découplage d'erreur [ERROR BYPASS]**

Utilisé pour sélectionner la longueur du découplage d'erreur voulu, entre 1 et 15 cadres.

Les valeurs correctes sont affichées sur l'affichage numérique quand la longueur du code de temps est plus courte que celle du découplage d'erreur, même si le code de temps entré dans le lecteur est faux.

Cependant, quand un code de temps à valeur discontinue est entré, un saut se produit et la détection du point de ce saut sera reportée pour une longueur de temps égale à celle du découplage d'erreur.

Ceci signifie que de meilleurs résultats seront obtenus en réduisant la longueur du découplage d'erreur auparavant, quand le code de temps à entrer, est de bonne qualité.

Le laisser normalement sur ON.

⑭ **Interrupteur d'impulsions extérieures/normal [EXT PULSE/TC]**

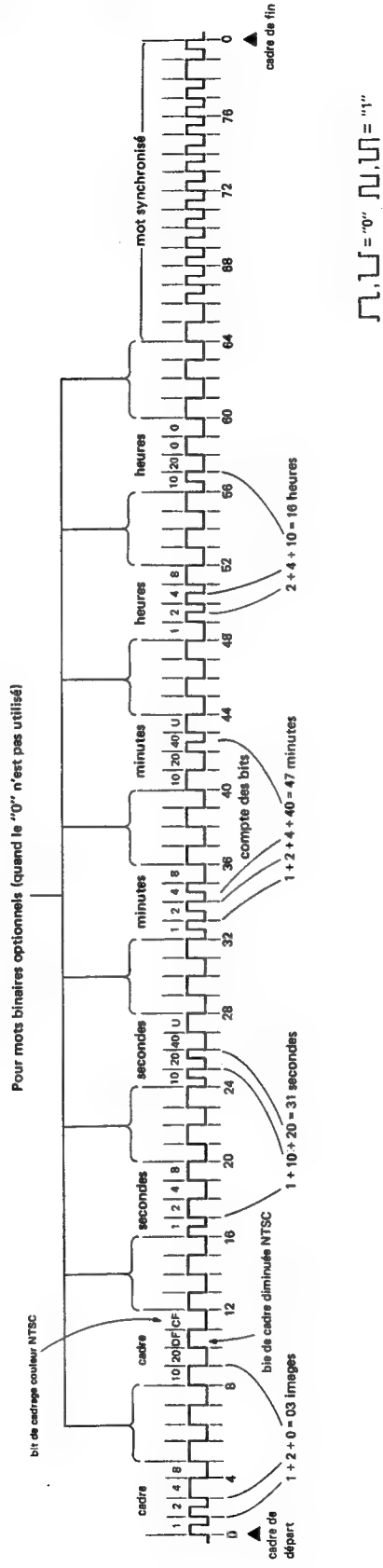
EXT PULSE: Quand la vitesse de bande du VTR est lente, le VITC est déchiffré et quand elle est rapide, les impulsions extérieures (cadres) sont déchiffrées, c'est-à-dire, des signaux de code de temps insérés extérieurement, en utilisant des impulsions CTL.

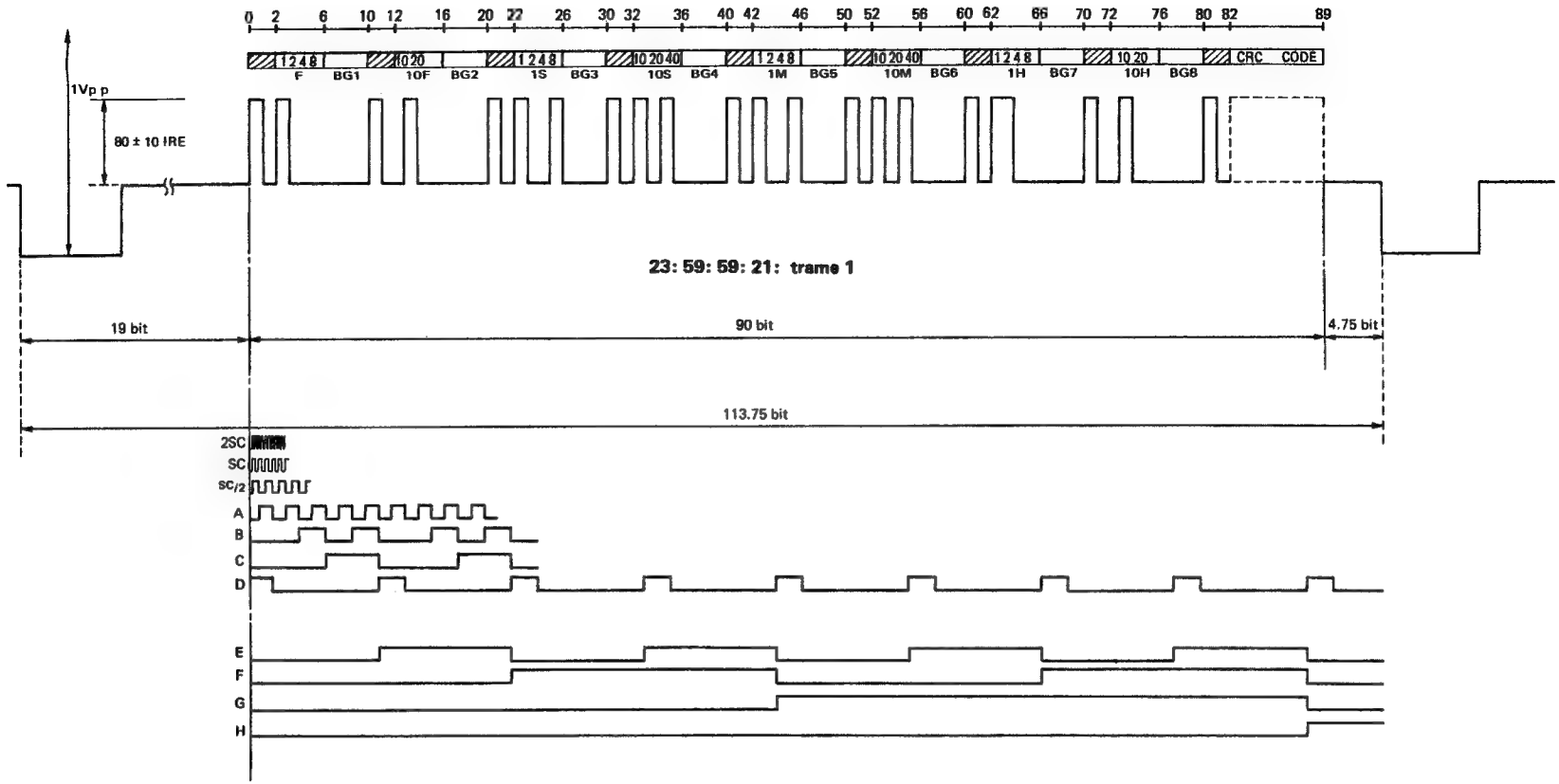
Dans ce cas, le VITC doit être continu. L'interrupteur [ERROR BYPASS ON/OFF] ⑱ du panneau des commandes de fonction doit être mis sur ON.

TC: Pour le fonctionnement normal (réglage à droite).

1-5. FORME D'ONDE

1-5-1. Code de temps standard SMPTE/EBU (1 image)





BG1 BG8 . . . Groupe binaire (bits utilisateurs)

0–1	Bits de synchronisation	0 fixé un 1 fixé zéro
2–5	unités d'images	
6–9	groupe premier binaire	(BG-1)
10–11	bits de synchronisation	10 fixé un 11 fixé zéro
12–13	Dizaines d'images	
14	Impulsion diminution cadre *1	
15	Impulsion de cadrage couleur *2	
16–19	groupe binaire secondaire	(BG-2)
20–21	bits de synchronisation	20 fixé un 21 fixé zéro
22–25	unités de secondes	
26–29	troisième groupe binaire	(BG-3)
30–31	bits de synchronisation	30 fixé un 31 fixé zéro
32–34	dizaines de secondes	
35	marque de trame	1,3 (5,7) *3 trame . . . zéro 2,4 (6,8) trame . . . un
36–39	quatrième groupe binaire	(BG-4)
40–41	bits de synchronisation	40 fixé un 41 fixé zéro
42–45	unités des minutes	
46–49	cinquième groupe binaire	(BG-5)
50–51	bits de synchronisation	50 fixé un 51 fixé un
52–54	dizaines de minutes	
55	bit sans assignation	(zéro jusqu'à spécification)
56–59	sixième groupe binaire	(BG-6)
60–61	bits de synchronisation	60 fixé un 61 fixé zéro
62–65	unités d'heures	
66–69	septième groupe binaire	(BG-7)
70–71	bits de synchronisation	70 fixé un 71 fixé zéro
72–73	dizaines d'heures	
74–75	bits sans assignation	(zéro jusqu'à spécification)
76–79	huitième groupe binaire	(BG-8)
80–81	bits de synchronisation	80 fixé un 81 fixé zéro
82–89	CODE CRC (code de vérification de redondance cyclique)	

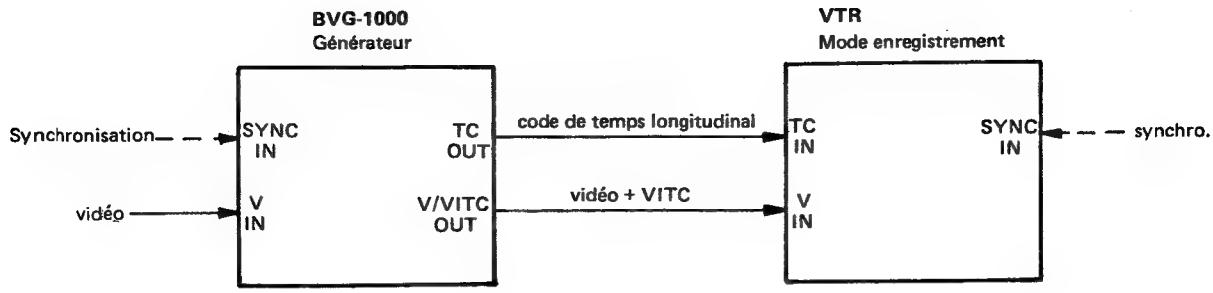
*1 "0" sauf avec NTSC

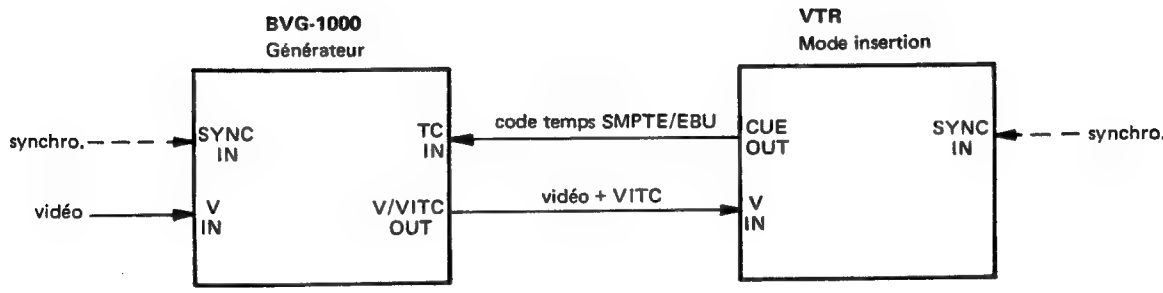
*2 seulement pour NTSC

*3 Les chiffres entre parenthèses sont pour le système PAL seul.

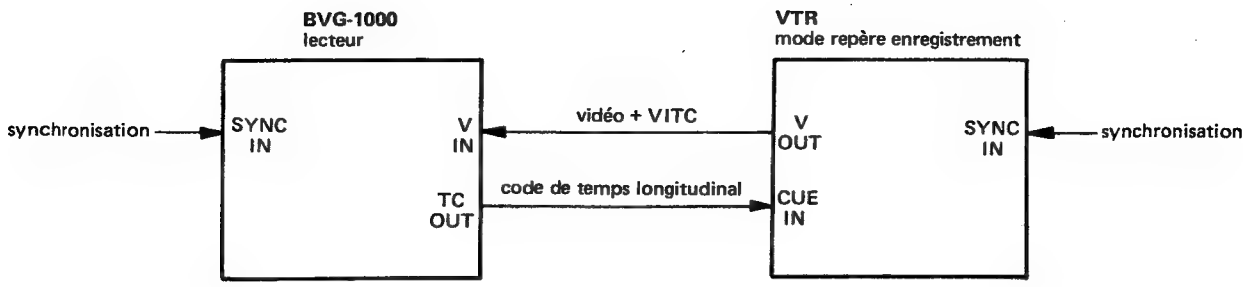
1-6. CONNEXIONS (Variations)

GENERATEUR

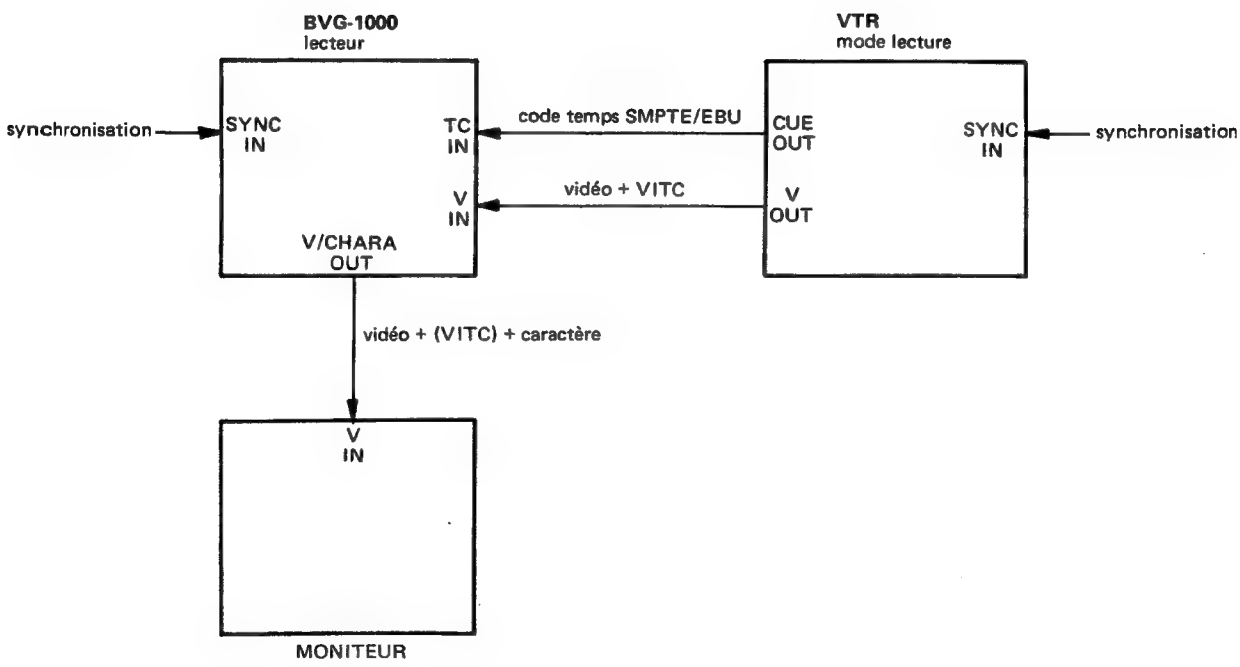




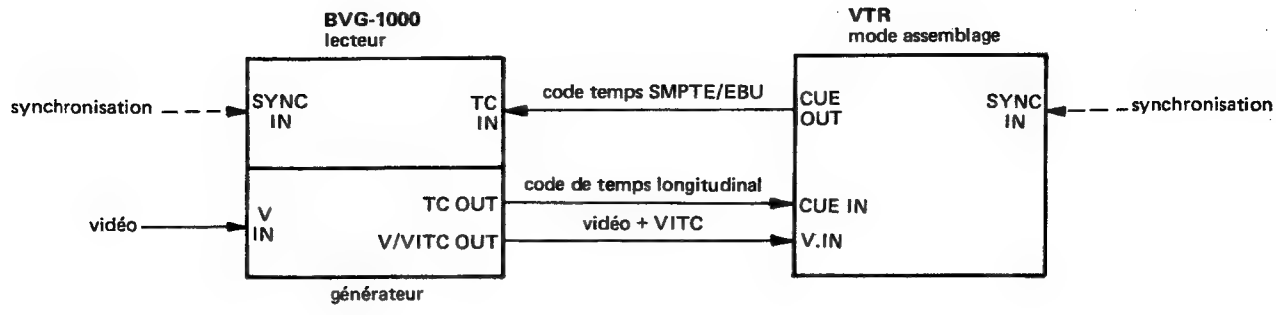
LECTEUR (GENERATEUR)



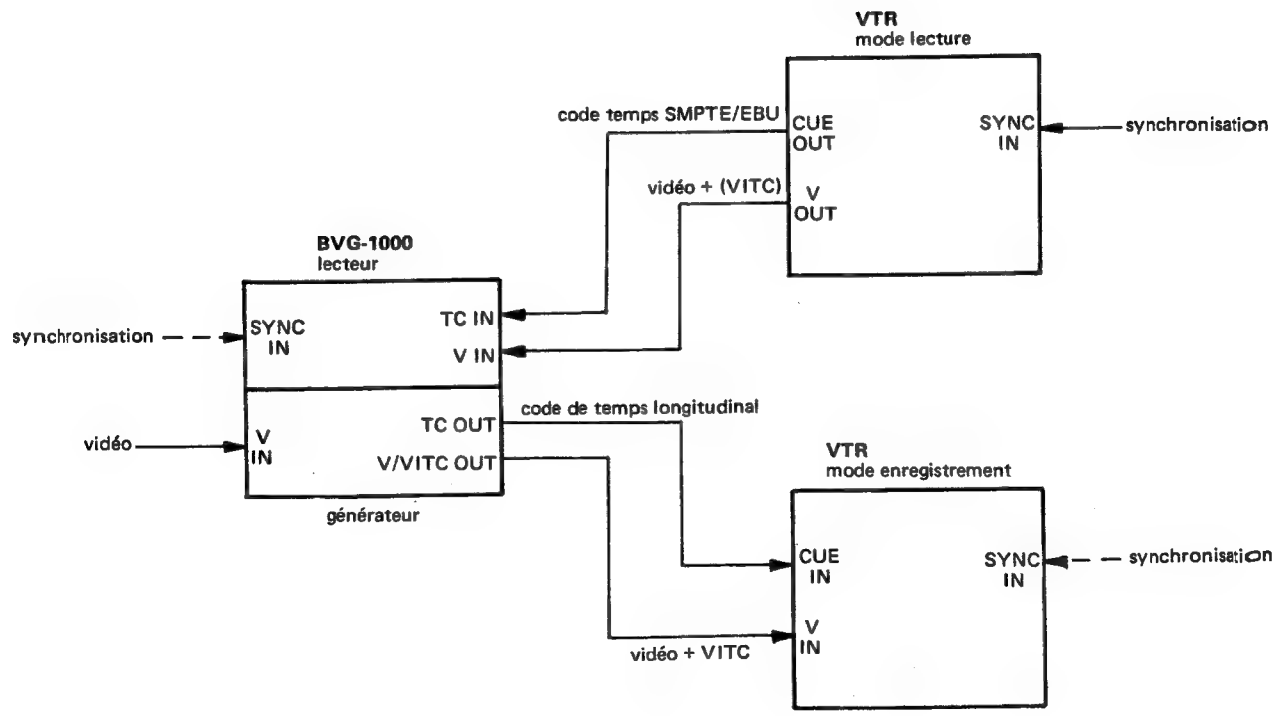
LECTEUR



GENERATEUR/LECTEUR (Verrouillage-code)



GENERATEUR/LECTEUR (deux VTR)



1-7. INTERMEDIAIRE DE COMMANDE DIGITALE

En utilisant un simple intermédiaire avec un niveau TTL, cet appareil peut être couplé à un autre équipement (équipement vidéo, éditeur, etc.). Quarante signaux sont disponibles à partir de la plaquette maîtresse et ils sont divisés entre les connecteurs [DATA I/O] et [REMOTE] du panneau de connexions.

Les signaux suivants sont disponibles aux connecteurs [DATA I/O].

Signal de sortie de donnée du lecteur et du générateur (TIME ou U-BIT)

Signal d'entrée donnée (TIME ou U-BIT) au générateur

Signal de synchronisation de cadrage couleur du générateur (code temps aligné à 15 Hz ou 12,5 Hz)

Signal de commutation code du générateur et signal de sortie mode DF

Signal de sortie trame du lecteur

Signal de sortie avance/marche arrière du lecteur

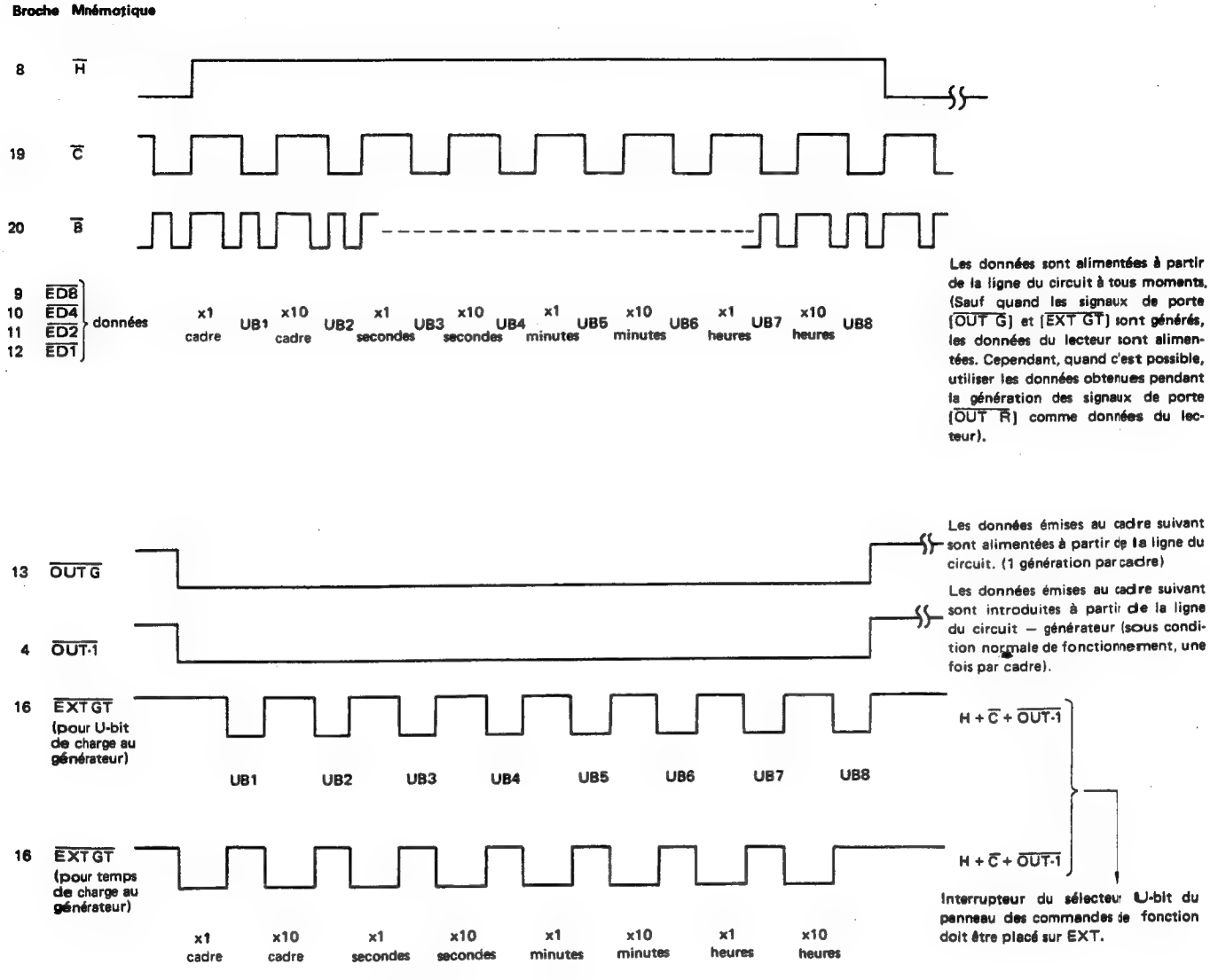
Tous les signaux de fonction du panneau des commandes de fonction sont disponibles aux connecteurs [REMOTE].

1-7-1. Dénomination des signaux du connecteur [DATA I/O]

Broche	Mnémonique	Entrée/sortie	Description
1			
2	GND		
3	GDF	sor	Signal de mode diminution d'image du générateur (toujours le niveau "L" avec le code de temps EBU)
4	$\overline{\text{OUT 1}}$	sor	Signal de la porte de l'entrée de données du générateur
5	$\overline{\text{FIELD}}$	sor	Signal de trame du lecteur
6	FWD	sor	Signal avance/marche arrière du lecteur
7	$\overline{\text{TMDL}}$	sor	Signal de commutation code de temps/VITC du lecteur
8	H	sor	Signal minutage du générateur
9	$\overline{\text{ED8}}$	ent sor	Signaux ligne circuit commun de données
10	$\overline{\text{ED4}}$	ent sor	
11	$\overline{\text{ED2}}$	ent sor	
12	$\overline{\text{ED1}}$	ent sor	
13	$\overline{\text{OUT G}}$	sor	Données ligne circuit commun doivent être signal du générateur
14	L A/4	sor	Signal minutage du générateur
15	$\overline{\text{LG}}$	sor	Signal minutage du générateur
16	$\overline{\text{EXT GT}}$	ent	Données ligne circuit commun doivent être signal externe
17	$\overline{\text{EXT}}$	sor	U-bit du générateur doit être mode extérieur
18	$\overline{\text{OUT R}}$	sor	Données ligne circuit commun doit être signal extérieur
19	$\overline{\text{C}}$	sor	Signal minutage du générateur
20	$\overline{\text{B}}$	sor	Signal minutage du générateur
21	MAT	ent	Signal (15 Hz ou 12,5 Hz) qui verrouille l'image couleur du générateur
22	$\overline{\text{FRM}}$	ent	Signal compte externe du lecteur
23	$\overline{\text{FD}}$	ent	Le compte externe du lecteur est un signal marche avant ou inverse
24	+5V		DC +5 V (300 mA)
25			

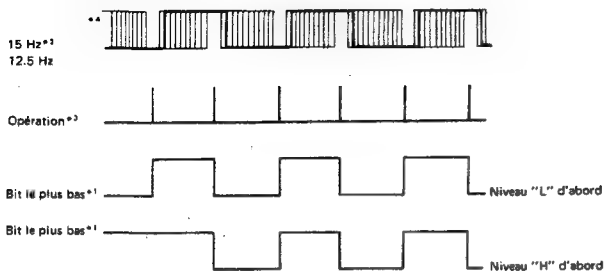
1-7-2. Phase des signaux

Utiliser les signaux suivants pour les opérations du GENERATEUR et des données I/O.



- **Signal de verrouillage de cadrage couleur introduit dans la broche MAT 21**

Quand les opérations du générateur se recouvrent quand le signal d'entrée de verrouillage de cadrage couleur est au niveau "L" (ceci n'est pas le cas où des données sont chargées à partir de la ligne du circuit), il n'y a pas de fonctionnement quand le bit le plus bas*4 est au niveau "H" parmi les données de cadre x1 du code de temps.

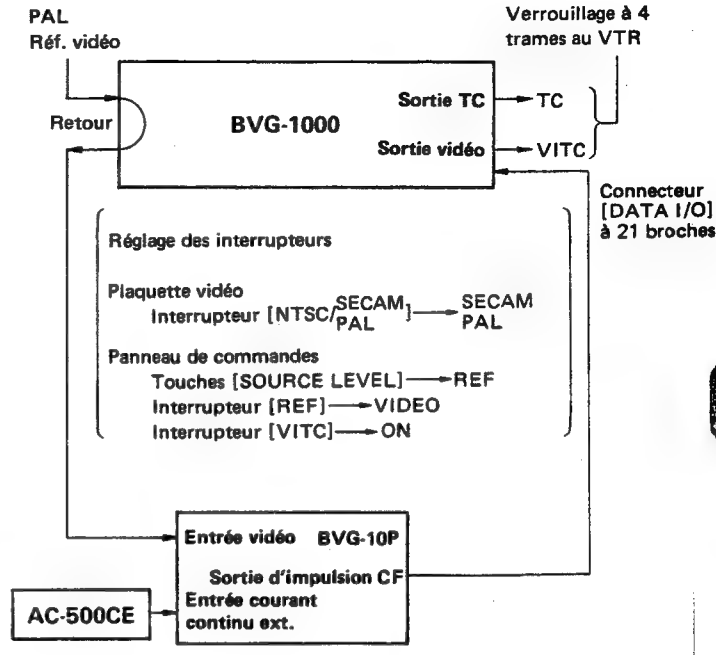


*2 Un minimum de plus d'un msec. est nécessaire avant le fonctionnement au niveau "L".
*3 Le signal de fonctionnement est généré dans un maximum de 0,3 msec. à partir de l'amortissement de la broche 15 $\overline{LG}$.
*4 Le niveau "H" ou "L" est acceptable comme polarité.

Dans le cas de signaux EBU, x1 seconde est selon la figure avec 0, 2, 4, 6, 8, mais la polarité du bit le plus bas *1 est inversé avec 1, 3, 5, 7, 9.

- **Application d'un verrouillage a quatre trames**

Quand on effectue l'opération de verrouillage à quatre trames en utilisant le BVG-10P (sur option), il est nécessaire de modifier la plaquette CF-2 du BVG-10P comme suit:

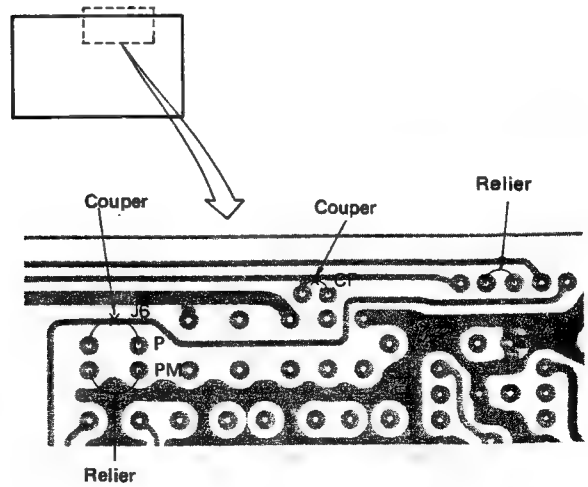


Remarque: Le BVG-10P est équipé de deux connecteurs de sortie d'impulsion CF situés sur le panneau des connecteurs. Une impulsion de quatre trames est obtenue à partir du connecteur de sortie d'impulsion CF droit.

1) Enlever les quatre vis qui tiennent le bord en caoutchouc, puis faire glisser le couvercle du panneau des connecteurs et le déposer.

2) Procéder aux modifications suivantes sur la plaquette CF2.

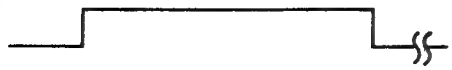
Emplacement des composants de la plaquette CF2.



3) Remettre le couvercle.

Utiliser les signaux suivants pour les opérations du READER et Data I/O.

Pour lire le code temps et les données U-BIT

Broche	Mnémonique		
8	$\overline{H}$		
19	$\overline{C}$		Comme page . . . 19
20	$\overline{B}$		Comme page . . . 19
9	$\overline{ED8}$	données	Comme page . . . 19
10	$\overline{ED4}$		
11	$\overline{ED2}$		
12	$\overline{ED1}$		
18	$\overline{OUT\ R}$		

$\overline{OUT\ R}$ indique que les données ligne du circuit sont les données du lecteur avec le niveau "L".

Données READER excepté les précédentes

Broche	Mnémonique	
5	$\overline{FIELD}$	niveau "H": première trame; niveau "L". seconde trame
6	FWD	niveau "H": avance rapide; niveau "L": rembobinage
7	$\overline{TMDL}$	niveau "H": VITC déchiffré; niveau "L": tous les autres

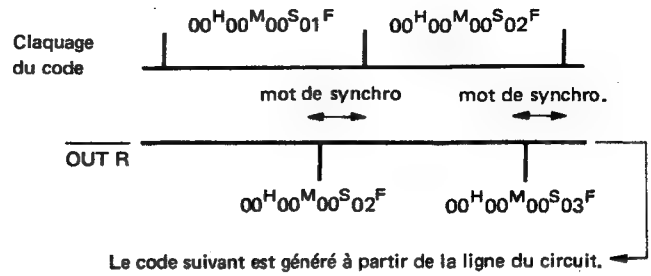
Signal d'entrée au LECTEUR (READER)

Broche	Mnémonique	
22	$\overline{FRM}$	Entrée impulsion compte CTL (charge 50%)
23	$\overline{FD}$	Connecteur d'entrée par lequel l'impulsion-compte CTL de la broche 22 est décomptée au niveau "H" et comptée jusqu'au niveau "L".

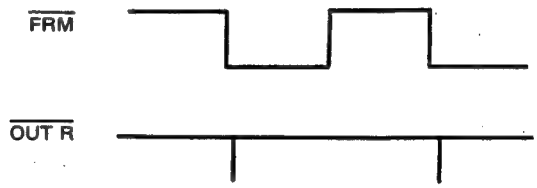
Ceci peut être utilisé dans les cas suivants:
Quand on utilise un lecteur avec VITC seulement
Quand on utilise un lecteur comme compteur CTL
Quand on utilise un lecteur comme compteur/décompteur

Les données de sortie du LECTEUR [READER] et les signaux [$\overline{OUT\ R}$] sont générés à partir de la ligne du circuit avec le minutage suivant:

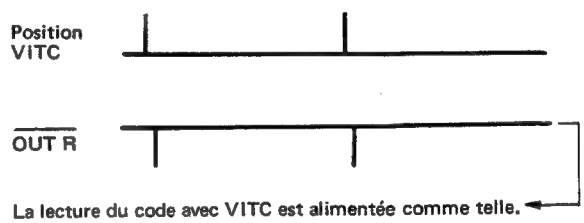
Pour lire le code de temps d'un signal repère



Pour compter le CTL



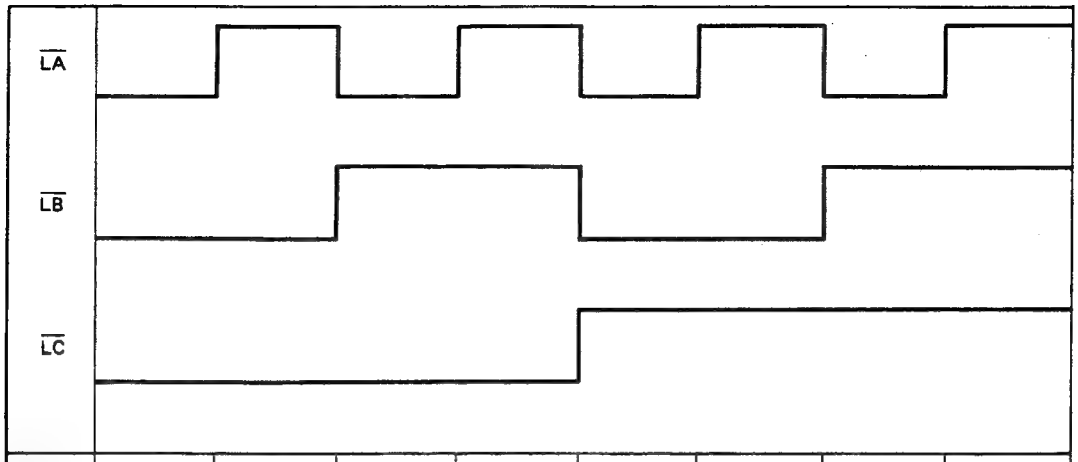
Pour déchiffrer le VITC



1-7-3. Dénomination des signaux du connecteur [REMOTE]

Broche	Mnémonique	Entrée/sortie	Description
1			
2			
3			
4			
5			
6			
7			
8			
9	RMC	ent sor	Signal de commutation REMOCON du panneau des commandes de fonction
10	+5V		CC +5V
11	$\overline{SW1}$	ent sor	Signaux de mode interrupteur du panneau des commandes de fonction
12	$\overline{PTT}$	ent sor	
13	$\overline{SW3}$	ent sor	
14	$\overline{SW2}$	ent sor	
15	$\overline{DS-2}$	sor	Signaux de données affichage du panneau des commandes de fonction
16	$\overline{DS-1}$	sor	
17	$\overline{DS-8}$	sor	
18	$\overline{DS-4}$	sor	
19	$\overline{LB}$	sor	Signaux minutage du générateur
20	$\overline{LA}$	sor	
21	$\overline{LAMP-1}$	sor	Signal voyant du panneau des commandes de fonction
22	$\overline{LC}$	sor	Signal minutage du générateur
23	GND		
24	$\overline{LAMP-2}$	sor	Signal voyant du panneau des commandes de fonction
25	GND		

1-7-4. Interrupteurs et signaux du panneau des commandes de fonction



	Position	7	6	5	4	3	2	1	0
	DS 1 DS 2 DS 4 DS8	x10 heures (UB-8)	x1 heures (UB-7)	x10 minutes (UB-6)	x1 minutes (UB-5)	x10 secondes (UB-4)	x1 secondes (UB-3)	x10 IMAGE (UB-2)	x1 IMAGE (UB-1)
Niveau H	LAMP 1				D4	D7	D6		D5
L	"S'allume"				REF	LINE	READER		EXT CODE
H	LAMP 2	D11	D10	D8			D12	D9	
L	"S'allume"	VITC	TC	ERREUR			CHAMP	IMAGE REDUITE	
H	PTT	Interr. 27 x 10 heures	Interr. 26 x 1 heure	Interr. 25 x 10 mn	Interr. 24 x 1 mn	Interr. 23 x 10 secondes	Interr. 22 x 1 seconde	Interr. 21 x10 IMAGES	Interr. 20 x 1 IMAGE
L									
*1	SET	(UB-8)	(UB-7)	(UB-6)	(UB-5)	(UB-4)	(UB-3)	(UB-2)	(UB-1)
H	SW1		DEFILE LECTEUR MAINTIEN			AUTOMATIQUE TC	VITC	ON ERREUR DECOUPLAGE OFF	ON CHIFFRE OFF
L									
H	SW2		LECTEUR ENTREE LECTEUR	ON LECTEUR	VITC	ON GENERATEUR	VIDEO REF	SOURCE	SELECTION
L			GENERATEUR	THRU	OFF	VITC OFF	SYNCHRO.	LECTEUR	REF
H	SW3		DEFILE GENERATEUR	NORMAL	GENERATEUR AFFICHAGE	AFFI- CHAGE TEMPS	INT U-BIT		ON REDUCTION IMAGE
L			MAINTIEN	REGLAGE	LECTEUR	U-BIT	THRU EXT		OFF

Les parenthèses indiquent l'affichage U-BIT

Les parenthèses indiquent l'affichage maintien U-BIT

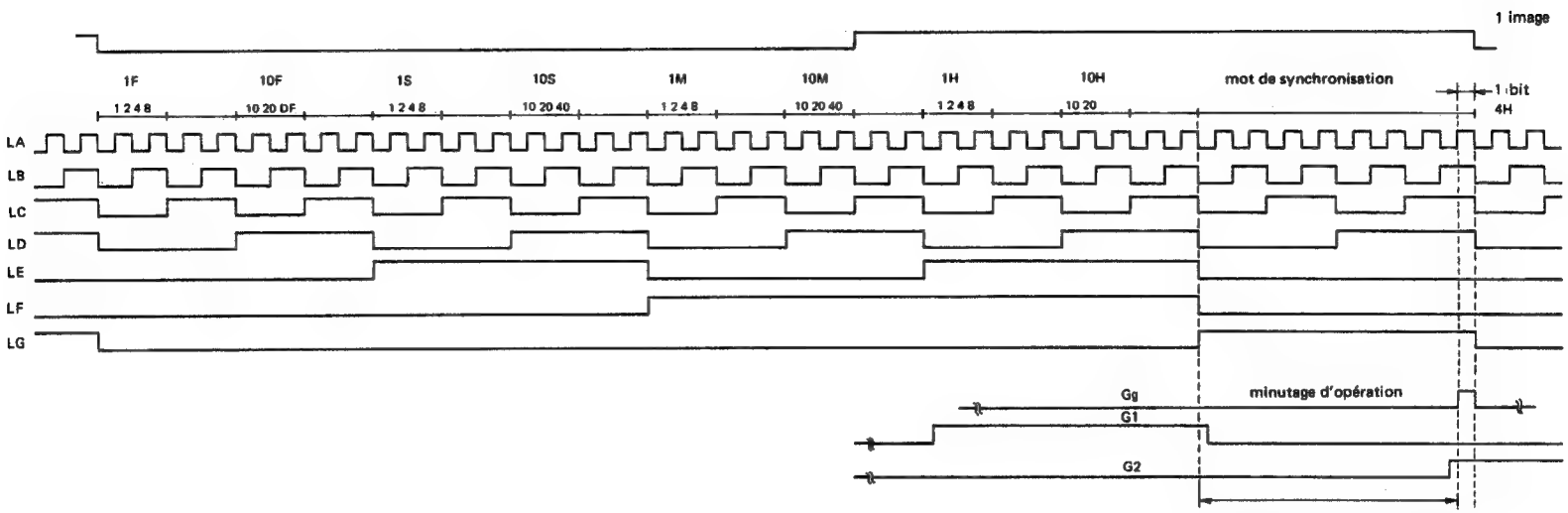
Remarque sur le tableau
Quand le minutage spécifié généré par $\overline{LA}$, $\overline{LB}$ et $\overline{LC}$ donne les positions 7 à 0:
Exemple 1: Quand la position 6 est au niveau "L" avec la borne $\overline{SW1}$ il y a maintien du lecteur,
Exemple 2: Quand les positions 5 et 4 sont au niveau "H", avec la borne $\overline{SW2}$, le lecteur VITC est activé (ON).

*1 niveau "L": REGLAGE (SET)

1-7-5. Précautions pour l'utilisation des connecteurs [DATA I/O] et [REMOTE]

Ne pas oublier les points suivants quand on mène les opérations des données I/O (entrée/sortie) en utilisant ces bornes:

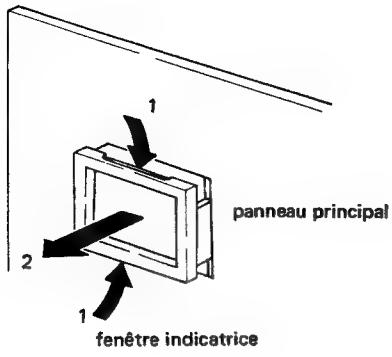
- Ne pas appliquer un signal externe aux bornes de signal de sortie.
  De même, placer une résistance de 4 700 ohms entre Vcc.
- Appliquer les signaux avec le minutage déterminé aux connecteurs [DATA I/O].
  L'entraînement se fait par ouverture du correcteur et mise en place d'une résistance de 4 700 ohms.
- Appliquer les signaux déterminés aux connecteurs d'entrée.
- Tous les signaux sont au niveau TTL. (FAN OUT 1)
- L'alimentation maximum possible pour le connecteur +5 V est de 300 mA.
  Quand c'est possible, utiliser un fournisseur d'alimentation extérieur.
- Pour le branchement avec ces connecteurs, utiliser une fiche de type D ou de sous-type D (voir page 1-55).



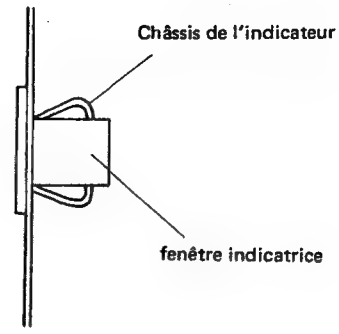
Quand G1 et G2 sont dans cette division (Gg), le AND apparaît pour être supérieur à l'impulsion entrée caractère (2H) et se situe dans la piste; le lecteur sera bloqué au générateur en même temps.

1-8. FIXATION DE L'INDICATEUR

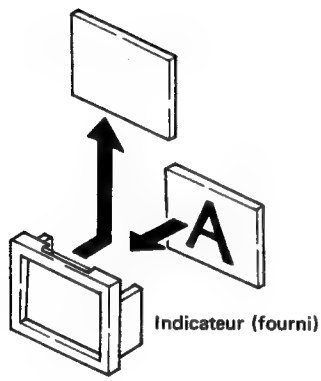
①



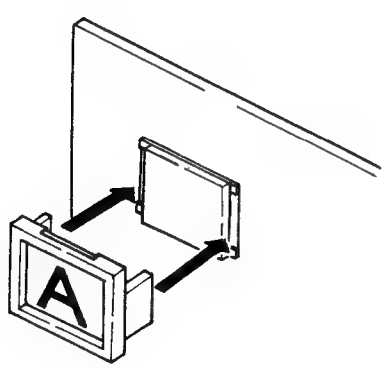
④

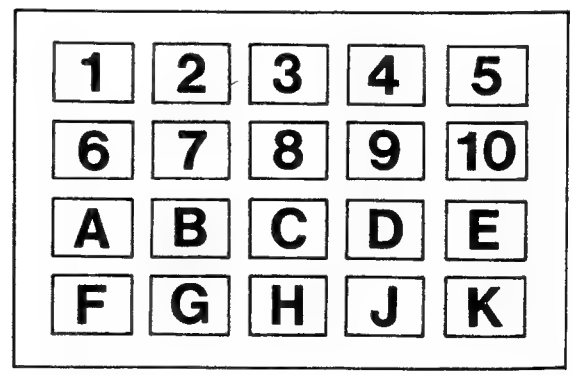


②



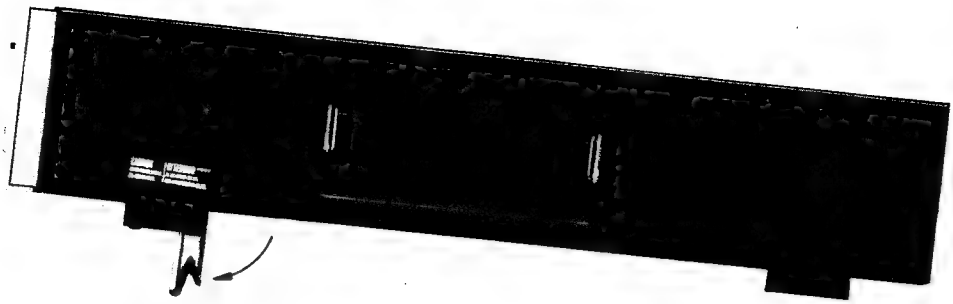
③





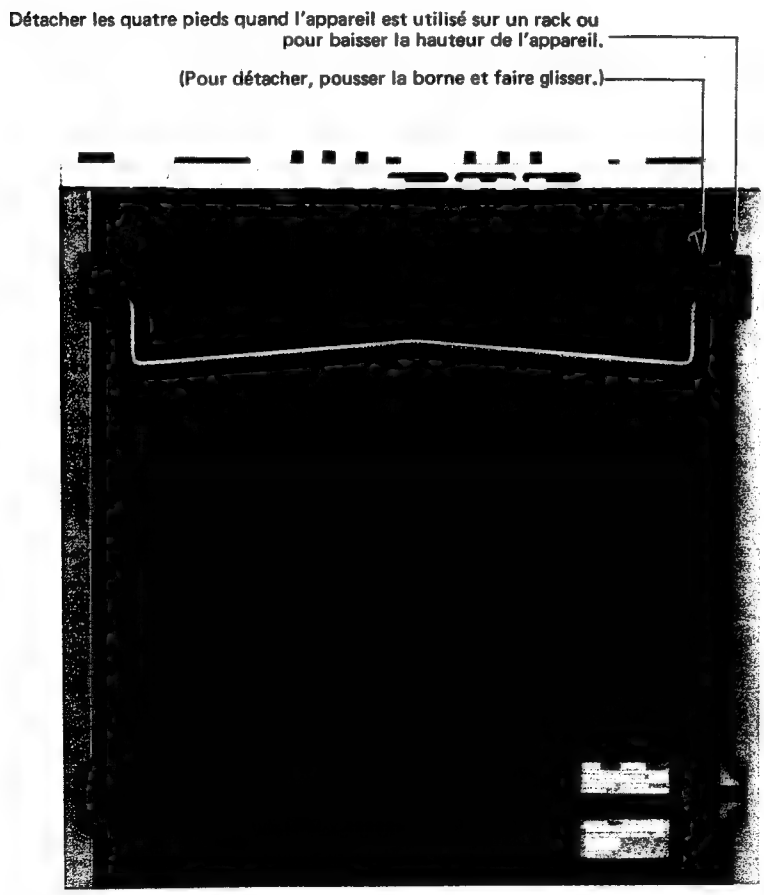
Pour l'indication de décompte, retirer les chiffres et les lettres avant de s'en servir.

1-9. UTILISATION SUR BUREAU

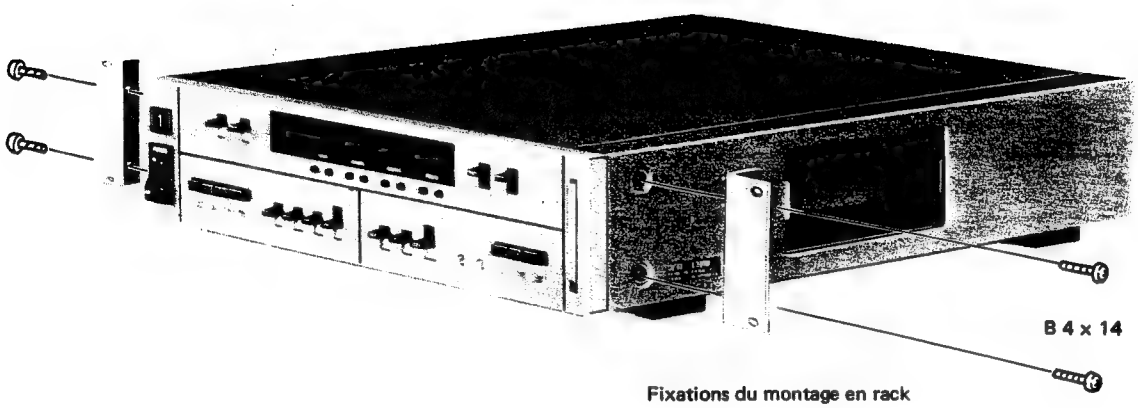


Pied inclinable

Pour utiliser l'appareil sur un bureau, etc., sortie le pied inclinable pour faciliter le maniement.

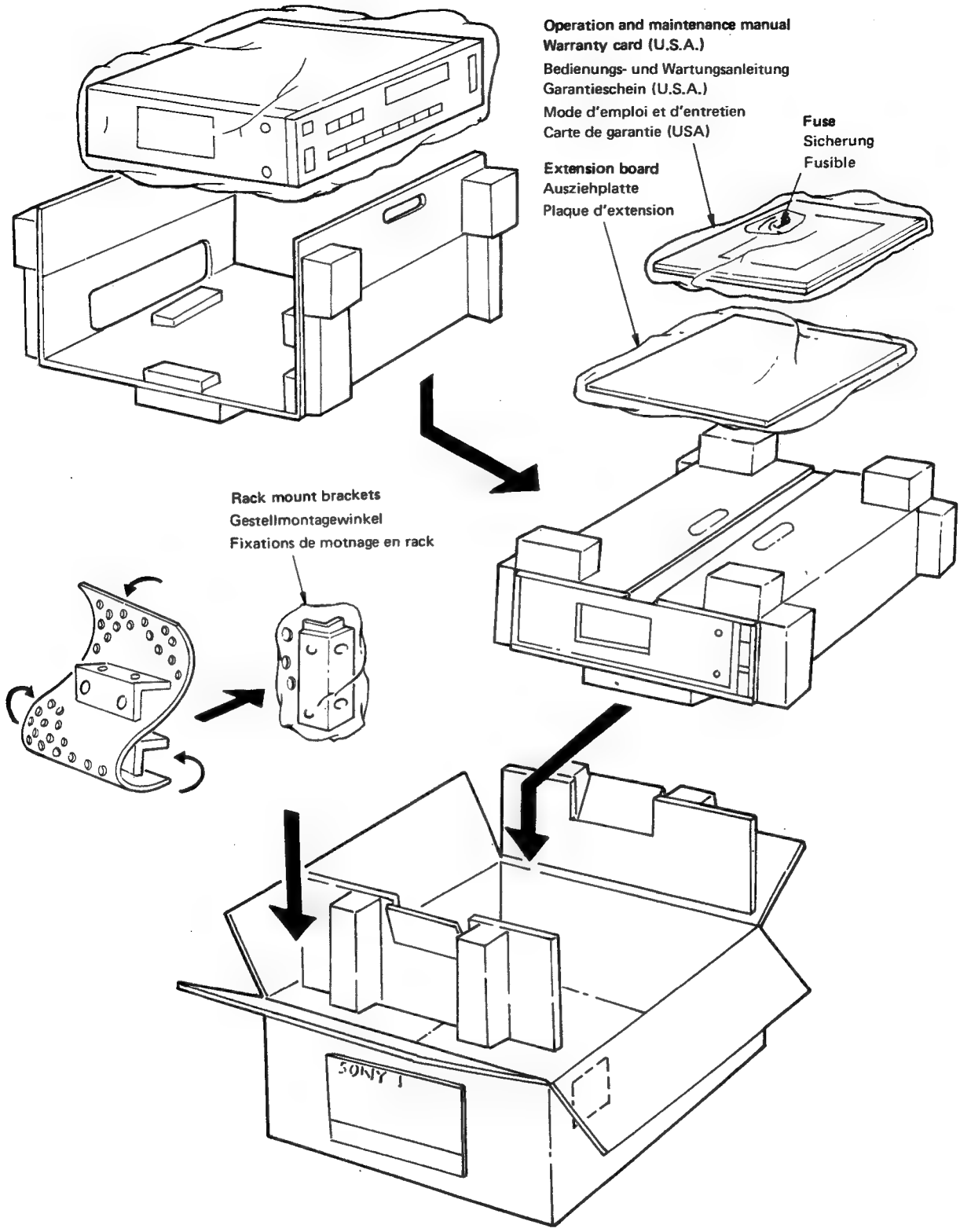


1-10. MONTAGE DES FIXATIONS DU RACK



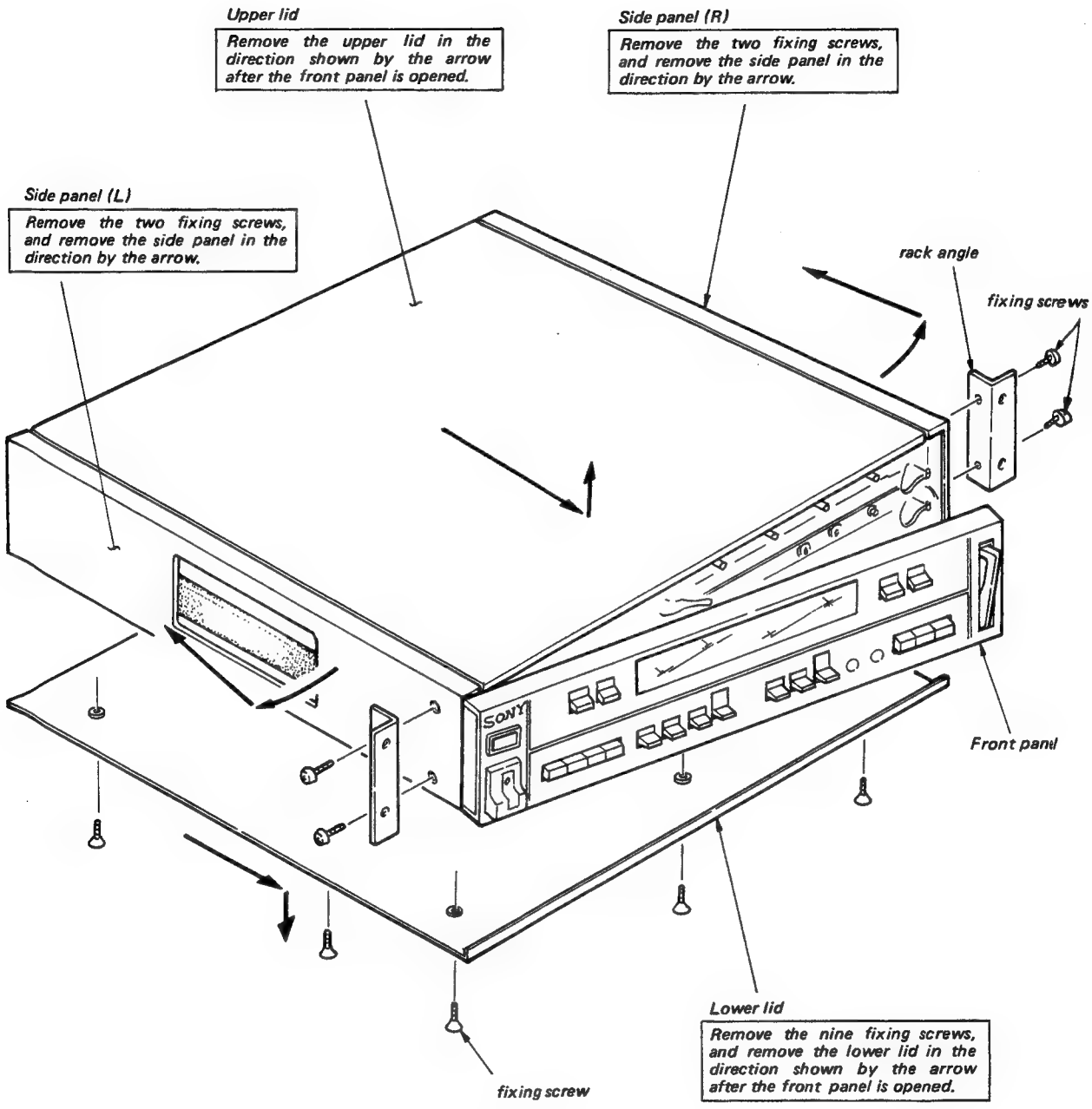
Fixations du montage en rack

1-11. PACKING/VERPACKUNG/EMBALLAGE



SECTION 2
DISASSEMBLY

2-1. DISASSEMBLY

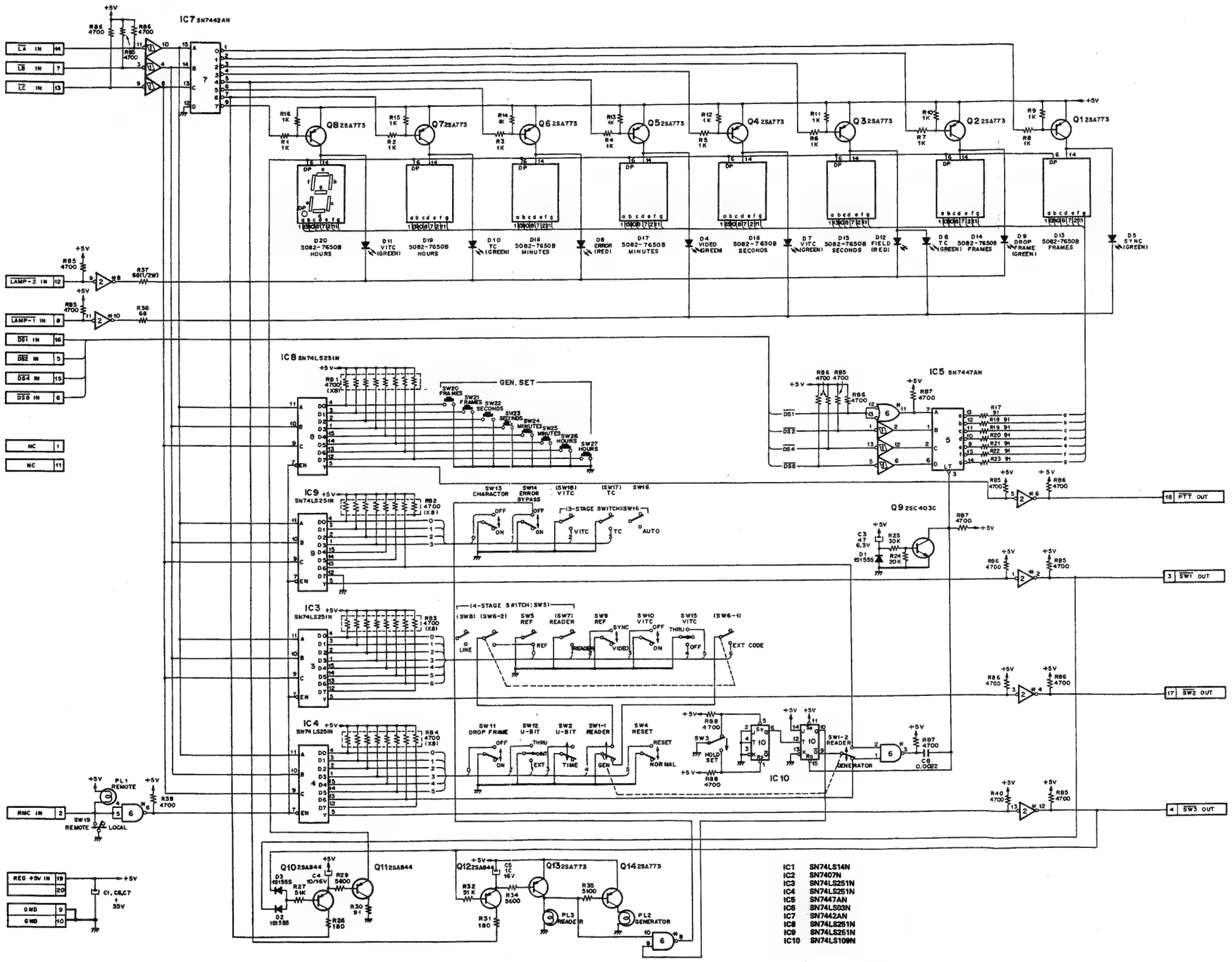


Note;
In ordinary maintenance it is not necessary to removes the side panel (R), side panel (L) and lower lid.

SECTION 3
DIAGRAM

FRNT BOARD REF. NO. 2000 SERIES

CONTROL PANEL
TIME CODE READ OUT DISPLAY



IC1 SN74LS14N
IC2 SN7407N
IC3 SN74LS251N
IC4 SN74LS251N
IC5 SN7447AN
IC6 SN74LS03N
IC7 SN7442AN
IC8 SN74LS251N
IC9 SN74LS251N
IC10 SN74LS109N

VIDO BOARD REF. NO. 7000 SERIES

VIDEO CIRCUIT
VITC ADDER OR KILLER
CHARACTER ADDER

SERIAL NO. UP TO 10040 (USA/CND)
SERIAL NO. UP TO 10010 (JAPAN)

VIDO former

VIDO former

VIDO BOARD REF. NO. 7,000 SERIES

IC1	SN75207N	IC-E1	SN7407N
IC4	HA17458GS	IC-E2	SN74LS221N
IC5	SN75207N	IC-E3	SN74161N
IC6	HA17458GS	IC-E4	SN74LS190N
IC7	HA17458GS	IC-F1	SN74LS221N
IC8	TA7506M	IC-F2	SN74LS04N
IC9	μPC4557C	IC-F3	SN74LS221N
IC10	μPC4557C	IC-F4	SN74LS107N
IC11	SN75207N	IC-G1	SN74LS221N
IC-A1	SN74LS00N	IC-G2	SN74LS109N
IC-A2	SN74LS04N	IC-G3	SN74LS08N
IC-A3	SN74LS14N	IC-G4	SN74LS11N
IC-A4	SN74LS259AN	IC-H1	SN74LS86N
IC-B1	SN74LS02N	IC-H2	SN74LS32N
IC-B2	SN7406N	IC-H3	SN7406N
IC-B3	SN74LS109N	IC-H4	SN74LS86N
IC-B4	SN74LS151N	IC-I2	SN74LS00N
IC-C1	SN74LS00N	IC-I3	SN74LS04N
IC-C2	SN74LS08N	IC-I4	SN7406N
IC-C3	MC14046BCP	IC-J1	SN74LS324N
IC-C4	SN74LS10N	IC-J2	SN74LS02N
IC-D1	SN74LS109N	IC-J3	SN74LS04N
IC-D2	SN74LS123N	IC-J4	SN7407N
IC-D3	SN74161N	IC-Q37	μA7812UC
IC-D4	SN74LS257N	IC-Q38	μA7912UC

VIDO BOARD REF. NO. 7000 SERIES

VIDEO CIRCUIT
VITC ADDER OR KILLER
CHARACTER ADDER

SERIAL NO. 10041 AND HIGHER (USA/CND)
SERIAL NO. 10011 AND HIGHER (JAPAN)
SERIAL NO. 10001 AND HIGHER (AEP)

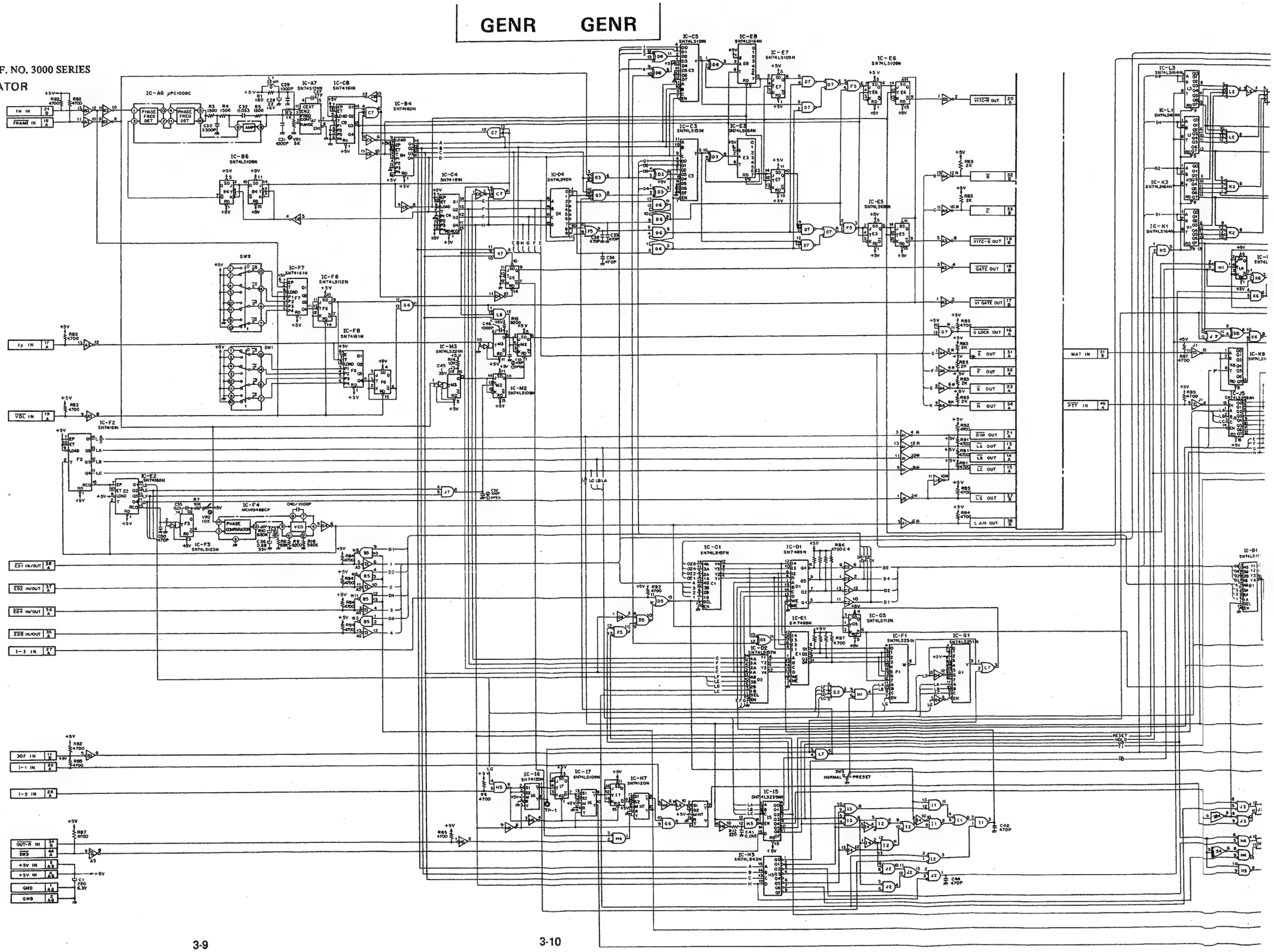
VIDO new VIDO new

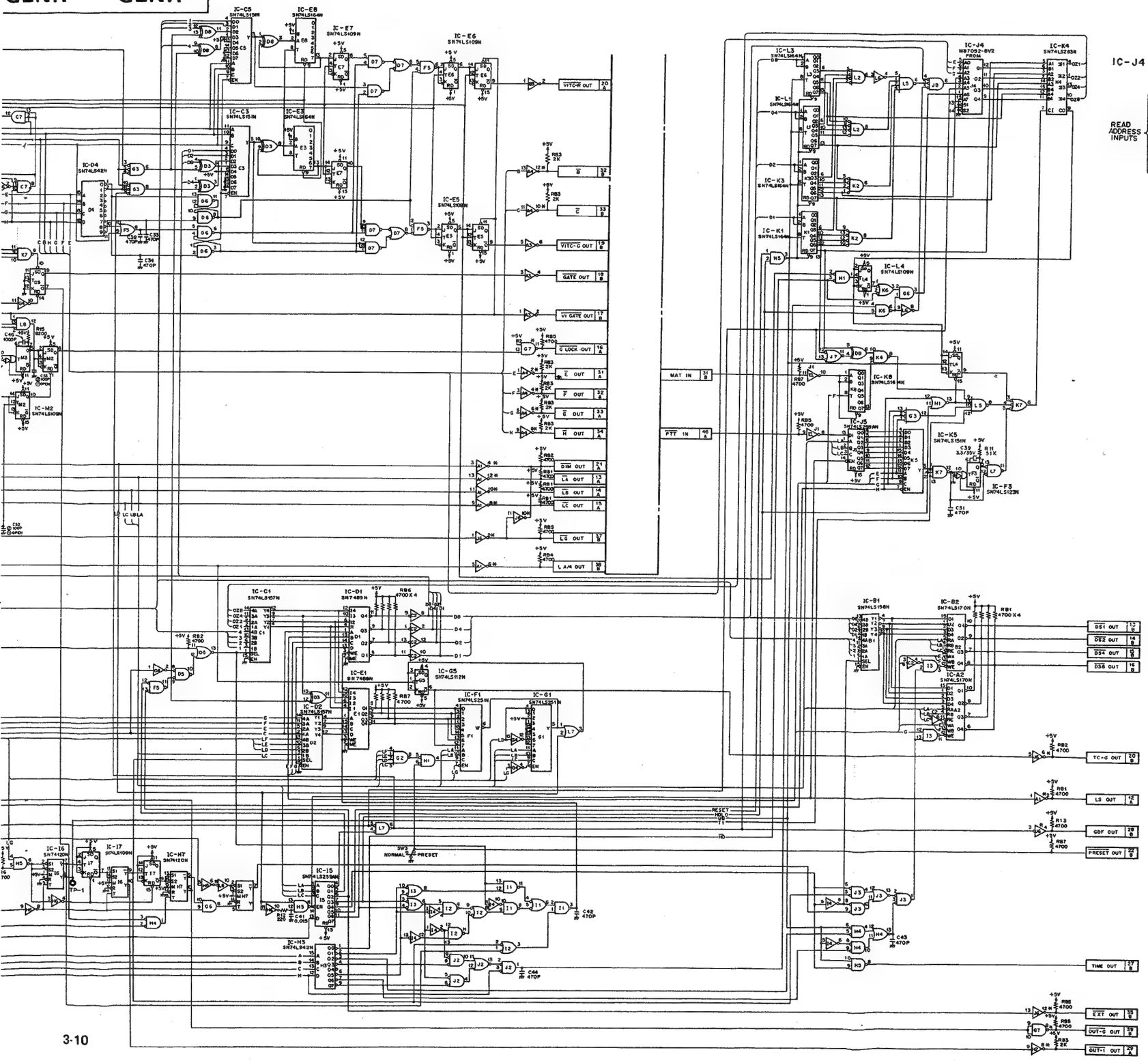
VIDO BOARD REF. NO. 7,000 SERIES

IC1	SN75207N	IC-D3	SN74LS86N
IC2	HA17458GS	IC-E1	SN74161N
IC3	SN75207N	IC-E2	SN74LS109N
IC4	HA17458GS	IC-E3	SN74LS00N
IC5	HA17458GS	IC-E4	SN7406N
IC6	μPC4557C	IC-F1	SN74161N
IC7	TA7506M	IC-F2	SN74LS32N
IC8	μPC4557C	IC-F3	SN74LS04N
IC9	SN75207N	IC-F4	SN74LS11N
IC10	μA7812UC	IC-G1	SN74LS190N
IC11	μA7912UC	IC-G2	SN74LS257N
IC-A1	SN74LS14N	IC-G3	SN74LS00N
IC-A2	SN7406N	IC-G4	SN74LS08N
IC-A3	SN74LS151N	IC-H1	SN74LS107N
IC-A4	SN74LS00N	IC-H2	SN74LS221N
IC-B1	SN74LS109N	IC-H3	SN74LS04N
IC-B2	SN74LS14N	IC-H4	SN7406N
IC-B3	SN74LS259AN	IC-I1	SN74LS221N
IC-B4	SN74LS02N	IC-I2	SN74LS109N
IC-C1	SN74LS123N	IC-I3	SN74LS221N
IC-C2	SN74LS08N	IC-I4	SN74LS86N
IC-C3	SN74LS10N	IC-J1	SN74LS02N
IC-C4	SN7407N	IC-J2	SN74LS10N
IC-D1	MC14046BCP	IC-J3	SN74LS221N
IC-D2	SN74LS04N	IC-J4	SN7407N
		IC-K1	SN74LS324N
		IC-K2	SN74LS11N

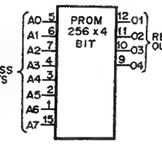
GENR BOARD REF. NO. 3000 SERIES

TIME CODE GENERATOR





IC-J4 SN74S287N-BV2
MB7052-BV2



READ ADDRESS INPUTS	ADDRESS(when converted into decimal number)															
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	A0	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
	A1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
	A2	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
	A3	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

ADDRESS(when converted into decimal number)	A7	A6	A5	A4	MEMORIZED DATA SHOWN IN HEXADECIMAL															
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	0	1	0	0	6	D	6	A	6	A	6	D	6	D	6	A	6	A	C	D
80	0	1	0	1	6	D	6	A	6	A	6	D	6	D	6	A	6	A	C	D
96	0	1	1	0	6	D	6	A	6	A	6	D	B	D	6	A	6	A	C	D
112	0	1	1	1	6	D	6	A	6	A	6	D	B	D	6	A	6	A	C	D
128	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
144	1	0	0	1	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
176	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
192	1	1	0	0	6	D	6	A	6	A	C	D	6	D	6	A	6	A	6	D
208	1	1	0	1	8	D	6	A	6	A	6	D	0	0	0	0	0	0	0	0
224	1	1	1	0	B	D	6	A	6	A	C	D	6	D	6	A	6	A	6	D
240	1	1	1	1	6	D	6	A	6	A	6	D	0	0	0	0	0	0	0	0

IC-A1	SN74LS05N	IC-G3	SN74LS27N
IC-A2	SN74LS170N	IC-G4	SN74LS04N
IC-A3	SN74LS04N	IC-G5	SN74LS112N
IC-A4	SN7406N	IC-G6	SN74LS08N
IC-A5	SN74LS14N	IC-G7	SN74LS03N
IC-A6	μPC1008C, MC4044P	IC-H1	SN74LS02N
IC-A7	SN74S124N	IC-H2	SN7406N
IC-B1	SN74LS158N	IC-H3	SN74LS42N
IC-B2	SN74LS170N	IC-H4	SN74LS02N
IC-B3	SN74LS04N	IC-H5	SN74LS00N
IC-B4	SN74160N	IC-H6	SN74LS04N
IC-B5	SN74LS38N	IC-H7	SN74120N
IC-B6	SN74LS109N	IC-I1	SN74LS00N
IC-B8	SN74LS90N	IC-I2	SN74LS00N
IC-C1	SN74LS157N	IC-I3	SN74LS00N
IC-C2	SN74LS04N	IC-I4	SN74LS04N
IC-C3	SN74LS151N	IC-I5	SN74LS259AN
IC-C4	SN74161N	IC-I6	SN74120N
IC-C5	SN74LS151N	IC-I7	SN74LS109N
IC-C6	SN74LS04N	IC-J1	SN74LS14N
IC-C7	SN74LS11N	IC-J2	SN74LS02N
IC-C8	SN74161N	IC-J3	SN74LS02N
IC-D1	SN7489N	IC-J4	MB7052-BV2
IC-D2	SN74LS157N	IC-J5	SN74LS259AN
IC-D3	SN74LS86N	IC-J6	SN74LS05N
IC-D4	SN74LS42N	IC-J7	SN74LS08N
IC-D5	SN74LS02N	IC-J8	SN74LS27N
IC-D6	SN74LS00N	IC-K1	SN74LS164N
IC-D7	SN74LS51N	IC-K2	SN7425N
IC-D8	SN74LS86N	IC-K3	SN74LS164N
IC-E1	SN7489N	IC-K4	SN74LS283N
IC-E2	SN74160N	IC-K5	SN74LS151N
IC-E3	SN74LS164N	IC-K6	SN74LS00N
IC-E5	SN74LS109N	IC-K7	SN74LS10N
IC-E6	SN74LS109N	IC-K8	SN74LS164N
IC-E7	SN74LS109N	IC-L1	SN74LS164N
IC-E8	SN74LS164N	IC-L2	SN7425N
IC-F1	SN74LS251N	IC-L3	SN74LS164N
IC-F2	SN74161N	IC-L4	SN74LS109N
IC-F3	SN74LS123N	IC-L5	SN74LS20N
IC-F4	MC14046BCP	IC-L6	SN74LS04N
IC-F5	SN74LS32N	IC-L7	SN74LS32N
IC-F6	SN74LS112N	IC-L8	SN74LS11N
IC-F7	SN74161N	IC-M2	SN74LS109N
IC-F8	SN74161N	IC-M3	SN74LS221N
IC-G1	SN74LS251N		
IC-G2	SN74LS20N		

NOTE:
1. THE PARTS MARKED BY ① OR ② HAVE DIFFERENT VALUE ACCORDING TO THE PRODUCTION SERIAL NUMBER. THE APPLICABLE SERIAL NUMBER IS SHOWN BELOW.

① UP TO 10,040 (USA/CND)
UP TO 10,010 (JAPAN)

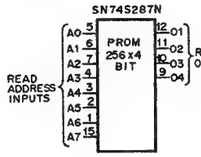
② 10,041 AND HIGHER (USA/CND)
10,010 AND HIGHER (JAPAN)

REDR BOARD REF. NO. 5000 SERIES

SERIAL NO. UP TO 10040 (USA/CND)
SERIAL NO. UP TO 10010 (JAPAN)

TIME CODE READER
CHARACTER GENERATOR

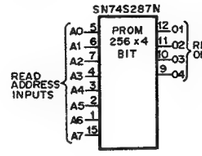
IC-C5



TRUTH TABLE
SN74S287N1(BV-1), PROM, 256 x 4 BIT

ADDRESS (when converted into decimal number)	A7	A6	A5	A4	MEMORIZED DATA SHOWN IN HEXADECIMAL															
READ ADDRESS INPUTS					0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A0					0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
A1					0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
A2					0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
A3					0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
0	0	0	0	0	1	1	1	1	1	1	1	1	3	3	3	3	1	1	1	1
16	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
32	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
48	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
64	0	1	0	0	5	5	4	4	4	4	4	4	4	4	4	4	4	4	5	4
80	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
96	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
112	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
128	1	0	0	0	1	1	1	1	1	1	1	1	3	3	3	3	1	1	1	1
144	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
160	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	9
176	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
192	1	1	0	0	5	5	4	4	4	4	4	4	4	4	4	4	4	4	5	4
208	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
224	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
240	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

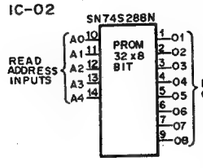
IC-H6



TRUTH TABLE
SN74S287N2(BV-2), PROM, 256 x 4 BIT

ADDRESS (when converted into decimal number)	A7	A6	A5	A4	MEMORIZED DATA SHOWN IN HEXADECIMAL															
READ ADDRESS INPUTS					0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A0					0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
A1					0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
A2					0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
A3					0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	0	1	0	0	6	D	6	A	6	A	6	D	6	D	6	A	6	A	C	D
80	0	1	0	1	6	D	6	A	6	A	6	D	6	D	6	A	6	A	C	D
96	0	1	1	0	6	D	6	A	6	A	6	D	B	D	6	A	6	A	C	D
112	0	1	1	1	6	D	6	A	6	A	6	D	B	D	6	A	6	A	C	C
128	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
144	1	0	0	1	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
176	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
172	1	1	0	0	6	D	6	A	6	A	C	D	6	D	6	A	6	A	6	D
208	1	1	0	1	8	D	6	A	6	A	6	D	0	0	0	0	0	0	0	0
224	1	1	1	0	B	D	6	A	6	A	C	D	6	D	6	A	6	A	6	D
240	1	1	1	1	6	D	6	A	6	A	6	D	0	0	0	0	0	0	0	0

IC-02



TRUTH TABLE
SN74S288N(BV-3), PROM, 32 x 8 BIT

ADDRESS (when converted into decimal number)	A4	A3	MEMORIZED DATA SHOWN IN HEXADECIMAL							
READ ADDRESS INPUTS			0	1	2	3	4	5	6	7
A0			0	1	0	1	0	1	0	1
A1			0	0	1	1	0	0	1	1
A2			0	0	0	0	1	1	1	1
0	0	0	00	00	00	00	00	00	00	00
8	0	1	00	00	00	00	00	00	00	00
16	1	0	03	F1	E1	82	D1	C1	82	B1
24	1	1	A1	82	91	85	00	00	00	00

IC-A1 SN74LS00N
IC-A2 SN74LS164N
IC-A3 SN74LS14N
IC-A4 SN74LS259AN
IC-A5 SN74LS14N

IC-A6 SN74LS14N
IC-A7 SN74LS38N
IC-B1 SN74LS00N
IC-B2 SN74LS86N
IC-B3 SN74LS10N

IC-B4 SN74LS151N
IC-B5 SN74LS04N
IC-B6 SN74LS257N
IC-B7 SN74LS189N
IC-B8 SN74LS00N

IC-C1 SN74LS195N
IC-C2 SN74LS109N
IC-C3 SN74LS109N
IC-C4 SN74LS191N
IC-C5 SN74S287N 1 (BV-1)

IC-C6 SN74LS257N
IC-C7 SN74LS258N
IC-C8 SN74LS164N
IC-D1 SN74LS191N
IC-D2 SN74LS191N

IC-D3 SN74LS04N
IC-D4 SN74LS190N
IC-D5 SN74LS151N
IC-D6 SN74S189N
IC-D7 SN74LS258N

IC-D8 SN7425N
IC-E1 SN74LS191N
IC-E2 SN74LS191N
IC-E3 SN74LS293N
IC-E4 SN74LS00N

IC-E5 SN74LS51N
IC-E6 SN74LS85N
IC-E7 SN74LS257N
IC-E8 SN74LS164N
IC-F1 SN74LS191N

IC-F2 SN74LS191N
IC-F3 SN74LS08N
IC-F4 SN74LS04N
IC-F5 SN74LS12N
IC-F6 SN74LS86N

IC-F7 SN74LS257N
IC-F8 SN74LS164N
IC-G1 SN74LS191N
IC-G2 SN74LS191N
IC-G3 SN74S189N

IC-G4 SN74LS258N
IC-G5 SN74LS08N
IC-G6 SN74LS253N
IC-G7 SN74LS86N
IC-G8 SN7425N

IC-H2 SN7425N
IC-H3 SN74LS194N
IC-H4 SN74S189N
IC-H5 SN74LS109N
IC-H6 SN74287N 2 (BV-2)

IC-H7 SN74LS00N
IC-H8 SN74LS164N
IC-I1 SN74LS190N
IC-I2 SN74LS12N
IC-I3 SN74LS257N

IC-I4 SN74S189N
IC-I5 SN74LS257N
IC-I6 SN74LS27N
IC-I7 SN74LS109N
IC-I8 SN74LS20N

IC-J1 SN74LS191N
IC-J2 SN74LS86N
IC-J3 SN74LS109N
IC-J4 SN74LS164N
IC-J5 SN7425N

IC-J6 SN74161N
IC-J7 SN74LS10N
IC-J8 SN74LS04N
IC-K1 SN74LS04N
IC-K2 SN74LS20N

IC-K3 SN74(LS)279N
IC-K4 SN74LS195N
IC-K6 SN74LS27N
IC-K7 SN74LS11N
IC-K8 SN74LS02N

IC-L1 SN74LS02N
IC-L2 SN74LS32N
IC-L3 SN74LS195N
IC-L4 SN74LS32N
IC-L5 SN74LS123N

IC-L6 SN74120N
IC-L7 SN74LS109N
IC-L8 SN74LS04N
IC-M1 SN74LS00N
IC-M2 SN74LS10N

IC-M3 SN74LS20N
IC-M4 SN74LS190N
IC-M5 SN74LS191N
IC-M6 SN74LS00N
IC-M7 SN74120N

IC-M8 SN74LS164N
IC-N1 SN74LS221N
IC-N2 SN74LS08N
IC-N3 SN74LS11N
IC-N4 SN74LS191N

IC-N5 SN74LS20N
IC-N6 SN74LS04N
IC-N7 SN74LS109N
IC-N8 SN74LS109N
IC-O1 SN74LS257N

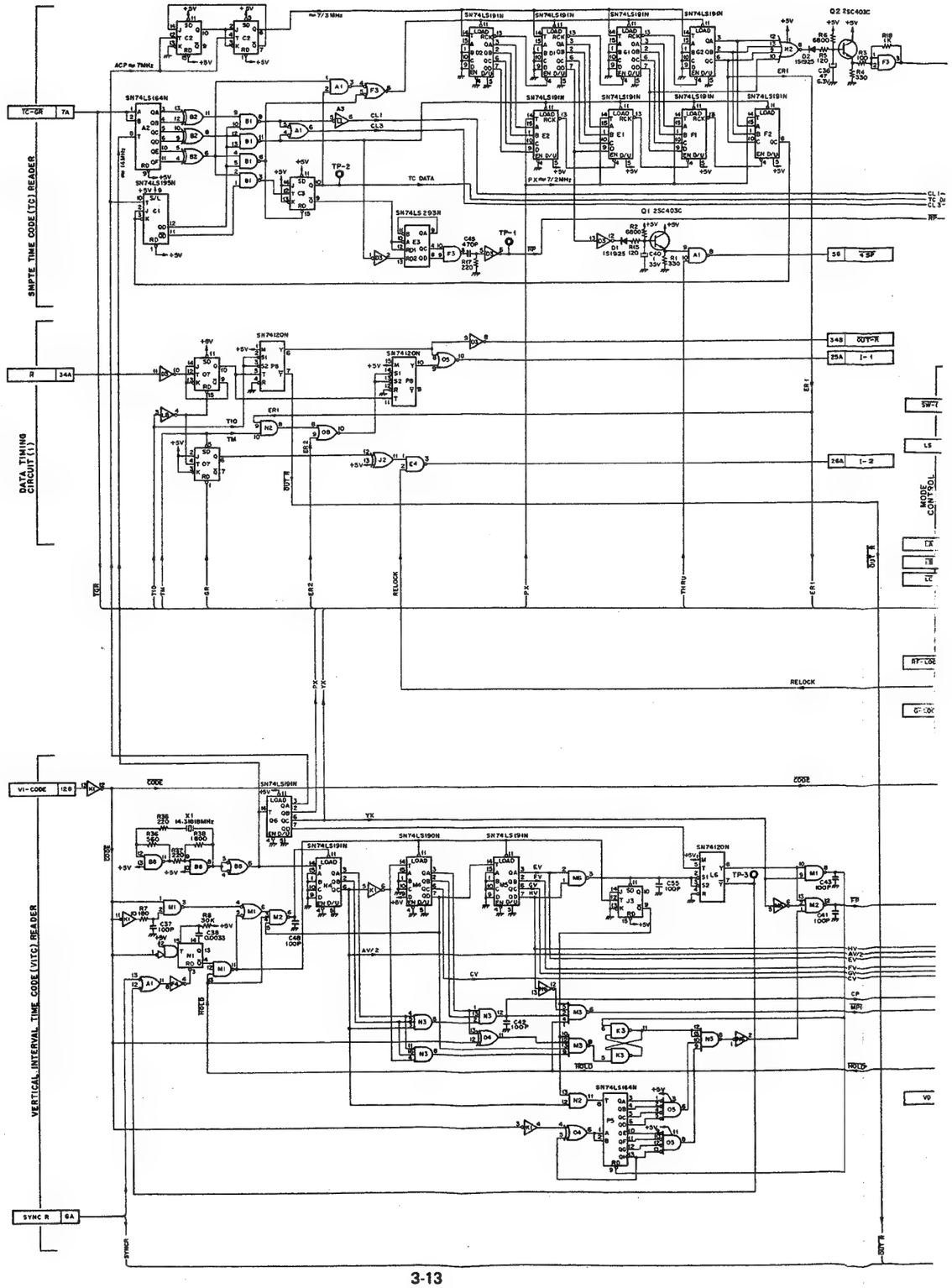
IC-O2 SN74S288N 1 (BV-3)
IC-O3 SN74161N
IC-O4 SN74LS86N
IC-O5 SN7425N
IC-O6 SN74LS191N

IC-O7 SN74LS109N
IC-O8 SN74LS02N
IC-P1 SN74S189N
IC-P2 SN74LS251N
IC-P3 SN74160N

IC-P4 SN74160N
IC-P5 SN74LS164N
IC-P6 SN74LS03N
IC-P7 SN74LS12N
IC-P8 SN74120N

IC-Q1 3258DC
IC-Q2 SN74LS107N
IC-Q3 SN74LS123N
IC-Q4 SN74161N
IC-Q5 SN74LS02N

IC-Q6 SN74LS20N
IC-Q7 SN74161N
IC-Q8 SN74LS12N



IC-L6 SN74120N
IC-L7 SN74LS109N
IC-L8 SN74LS04N
IC-M1 SN74LS00N
IC-M2 SN74LS10N

IC-M3 SN74LS20N
IC-M4 SN74LS190N
IC-M5 SN74LS191N
IC-M6 SN74LS00N
IC-M7 SN74120N

IC-M8 SN74LS164N
IC-N1 SN74LS221N
IC-N2 SN74LS08N
IC-N3 SN74LS11N
IC-N4 SN74LS191N

IC-N5 SN74LS20N
IC-N6 SN74LS04N
IC-N7 SN74LS109N
IC-N8 SN74LS109N
IC-O1 SN74LS257N

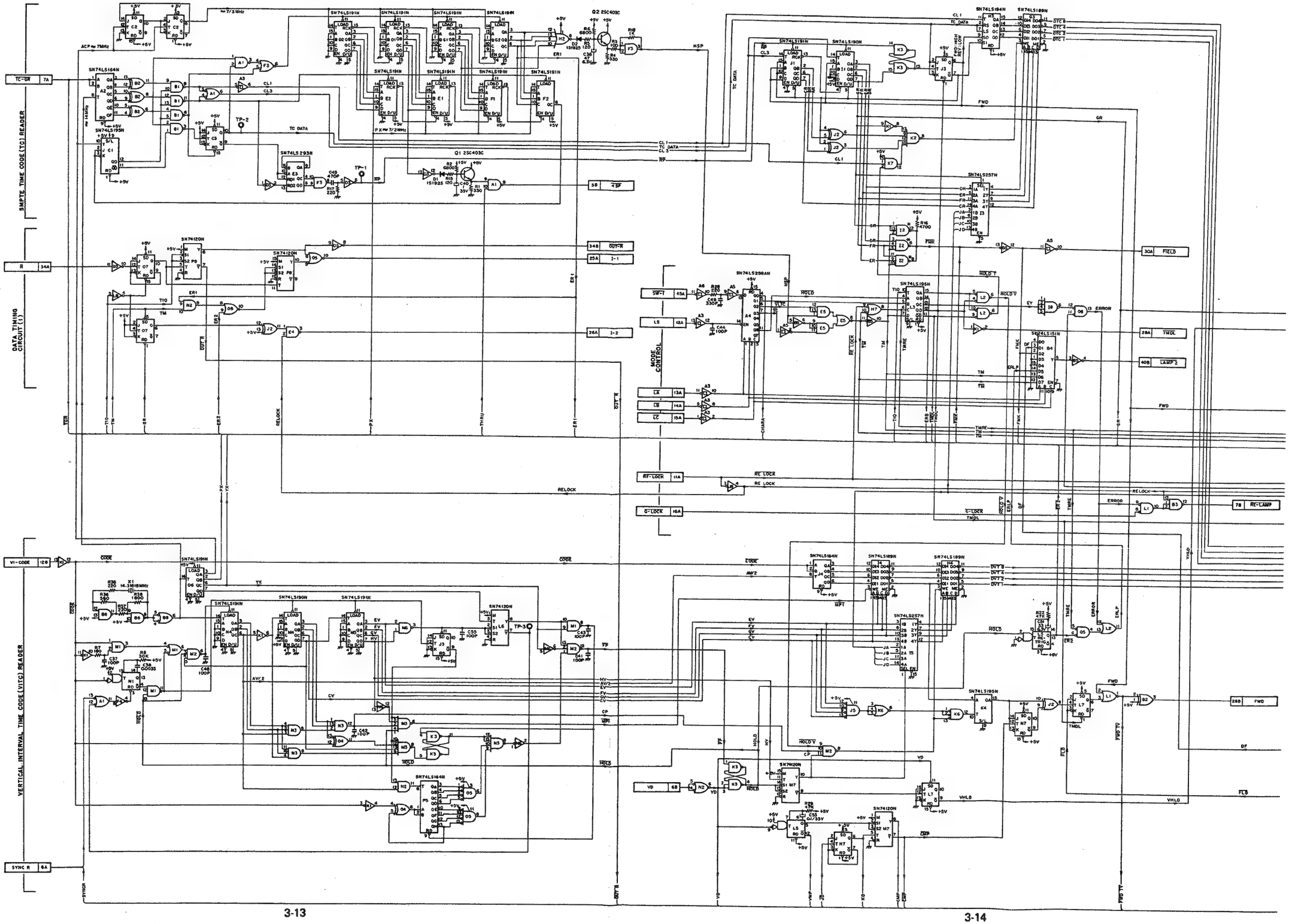
IC-O2 SN74S288N 1 (8V-3)
IC-O3 SN74161N
IC-O4 SN74LS86N
IC-O5 SN7425N
IC-O6 SN74LS191N

IC-O7 SN74LS109N
IC-O8 SN74LS02N
IC-P1 SN74S189N
IC-P2 SN74LS251N
IC-P3 SN74160N

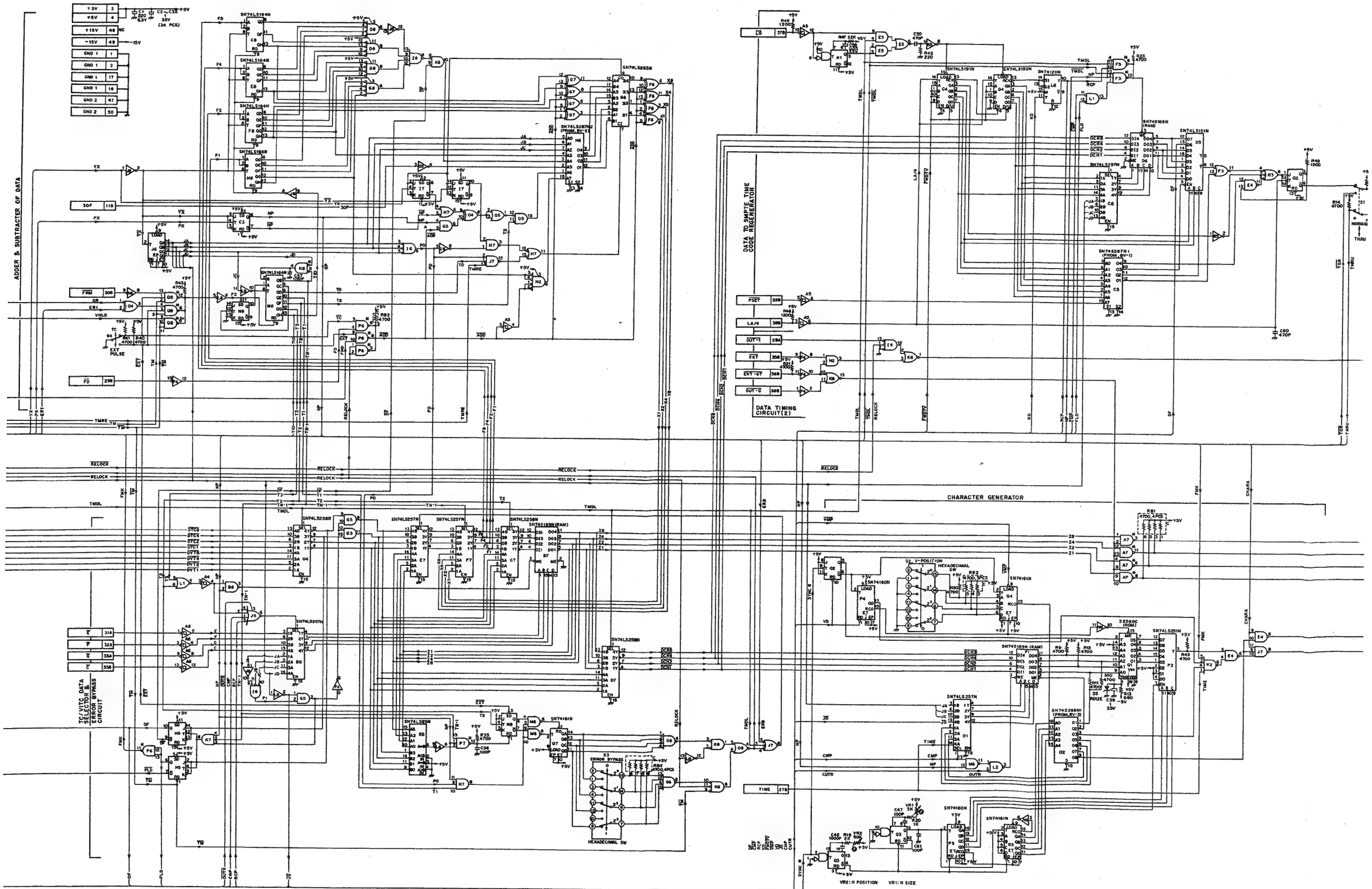
IC-P4 SN74160N
IC-P5 SN74LS164N
IC-P6 SN74LS03N
IC-P7 SN74LS12N
IC-P8 SN74120N

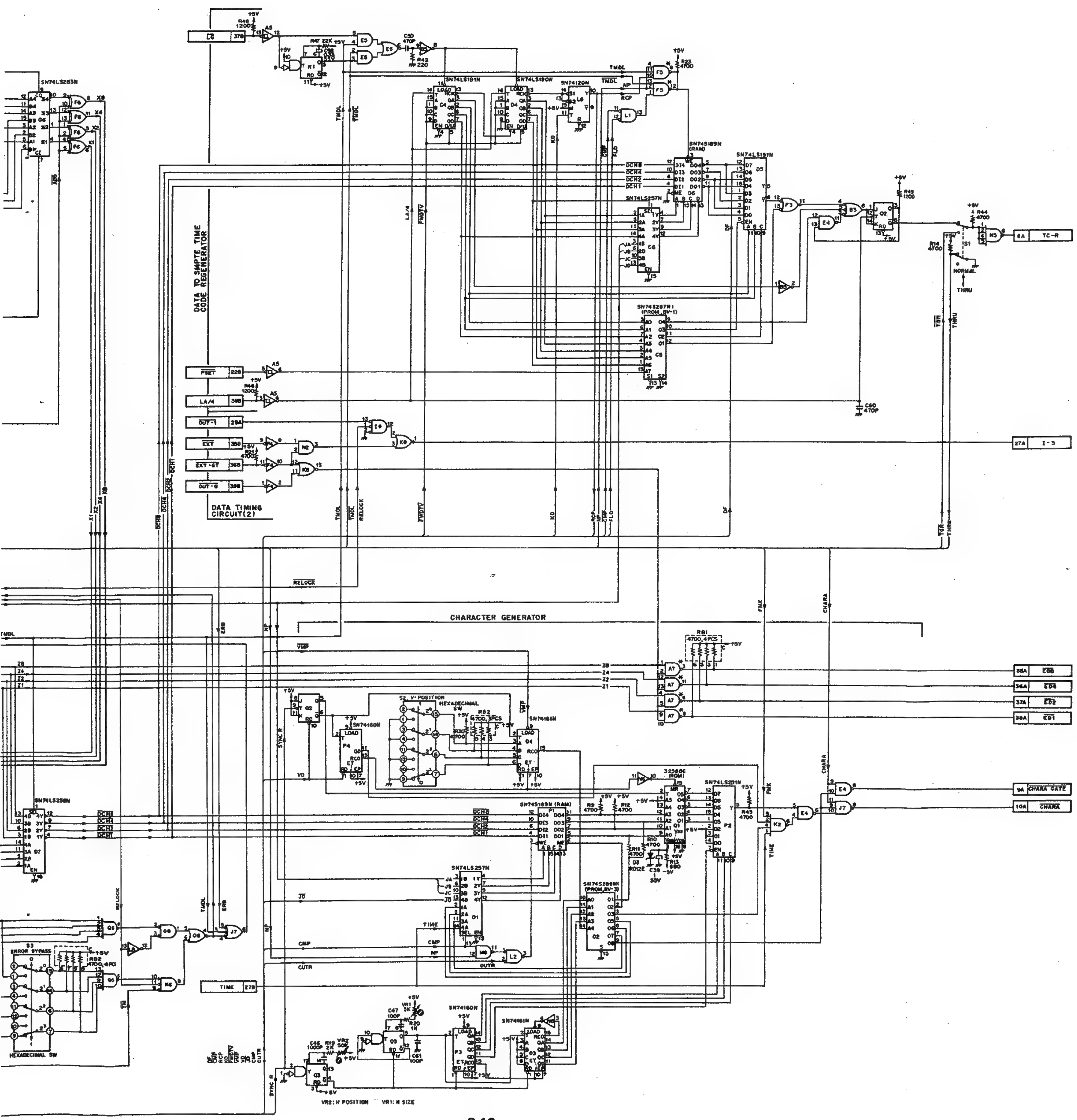
IC-Q1 3258DC
IC-Q2 SN74LS107N
IC-Q3 SN74LS123N
IC-Q4 SN74161N
IC-Q5 SN74LS02N

IC-Q6 SN74LS20N
IC-Q7 SN74161N
IC-Q8 SN74LS12N



3-13 3-14


ADDER & SUBTRACTER OF DATA
DATA TO SMPTE TIME CODE REGENERATOR
DATA TIMING CIRCUIT(2)
CHARACTER GENERATOR
TC/VITC DATA SELECTOR & ERROR BYPASS CIRCUIT
ERROR BYPASS
HEXADECIMAL SW
S2 V-POSITION HEXADECIMAL SW
VR2: H POSITION VR1: H SIZE
+5V
-15V
SN74LS164N
SN74LS283N
SN74LS287N2 (PROM,BV-2)
SN74LS257N
SN74LS258N
SN74LS298N (RAM)
SN74LS152N
SN74161N
SN74LS191N
SN74S190N
SN74120N
SN74S169N (RAM)
SN74LS151N
SN74LS297N
SN74S287N1 (PROM,BV-1)
SN74S288N1 (PROM,BV-3)
SN74160N
32S80C (ROM)
SN74LS251N
RELOCK
TMDL
TIME
NORMAL
THRU

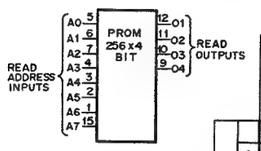

DATA TO SMPTE TIME CODE REGENERATOR
DATA TIMING CIRCUIT(2)
CHARACTER GENERATOR
VR2: H POSITION
VR1: H SIZE
HEXADECIMAL SW
ERROR BYPASS
TC-R
I-3
CHARA GATE
CHARA
TIME

REDR BOARD REF. NO. 5000 SERIES

TIME CODE READER
CHARACTER GENERATOR

SERIAL NO. 10041 AND HIGHER (USA/CND)
SERIAL NO. 10011 AND HIGHER (JAPAN)
SERIAL NO. 10001 AND HIGHER (AEP)

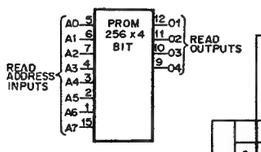
IC-C5 SN74S287N-BV1 MB7052-BV1



READ ADDRESS INPUTS	ADDRESS (when converted into decimal number) 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A0	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
A1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
A2	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
A3	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

ADDRESS (when converted into decimal number)	A7	A6	A5	A4	MEMORIZED DATA SHOWN IN HEXADECIMAL															
0	0	0	0	0	1	1	1	1	1	1	1	1	3	3	3	3	1	1	1	1
16	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
32	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
48	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
64	0	1	0	0	5	5	4	4	4	4	4	4	4	4	4	4	4	4	5	4
80	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
96	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
112	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
128	1	0	0	0	1	1	1	1	1	1	1	1	3	3	3	3	1	1	1	1
144	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
160	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
176	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	9
192	1	1	0	0	5	5	4	4	4	4	4	4	4	4	4	4	4	4	5	4
208	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
224	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
240	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

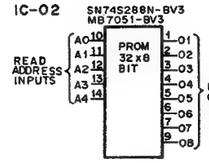
IC-H6 SN74S287N-BV2 MB7052-BV2



READ ADDRESS INPUTS	ADDRESS (when converted into decimal number) 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A0	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
A1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
A2	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
A3	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

ADDRESS (when converted into decimal number)	A7	A6	A5	A4	MEMORIZED DATA SHOWN IN HEXADECIMAL															
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	0	1	0	0	6	D	6	A	6	A	6	D	6	D	6	A	6	A	C	D
80	0	1	0	1	6	D	6	A	6	A	6	D	6	D	6	A	6	A	C	D
96	0	1	1	0	6	D	6	A	6	A	6	D	B	D	6	A	6	A	C	D
112	0	1	1	1	6	D	6	A	6	A	6	D	B	D	6	A	6	A	C	D
128	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
144	1	0	0	1	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
176	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
172	1	1	0	0	6	D	6	A	6	A	C	D	6	D	6	A	6	A	6	D
208	1	1	0	1	8	D	6	A	6	A	6	D	0	0	0	0	0	0	0	0
224	1	1	1	0	B	D	6	A	6	A	C	D	6	D	6	A	6	A	6	D
240	1	1	1	1	6	D	6	A	6	A	6	D	0	0	0	0	0	0	0	0

IC-02 SN74S288N-BV3 MB7051-BV3

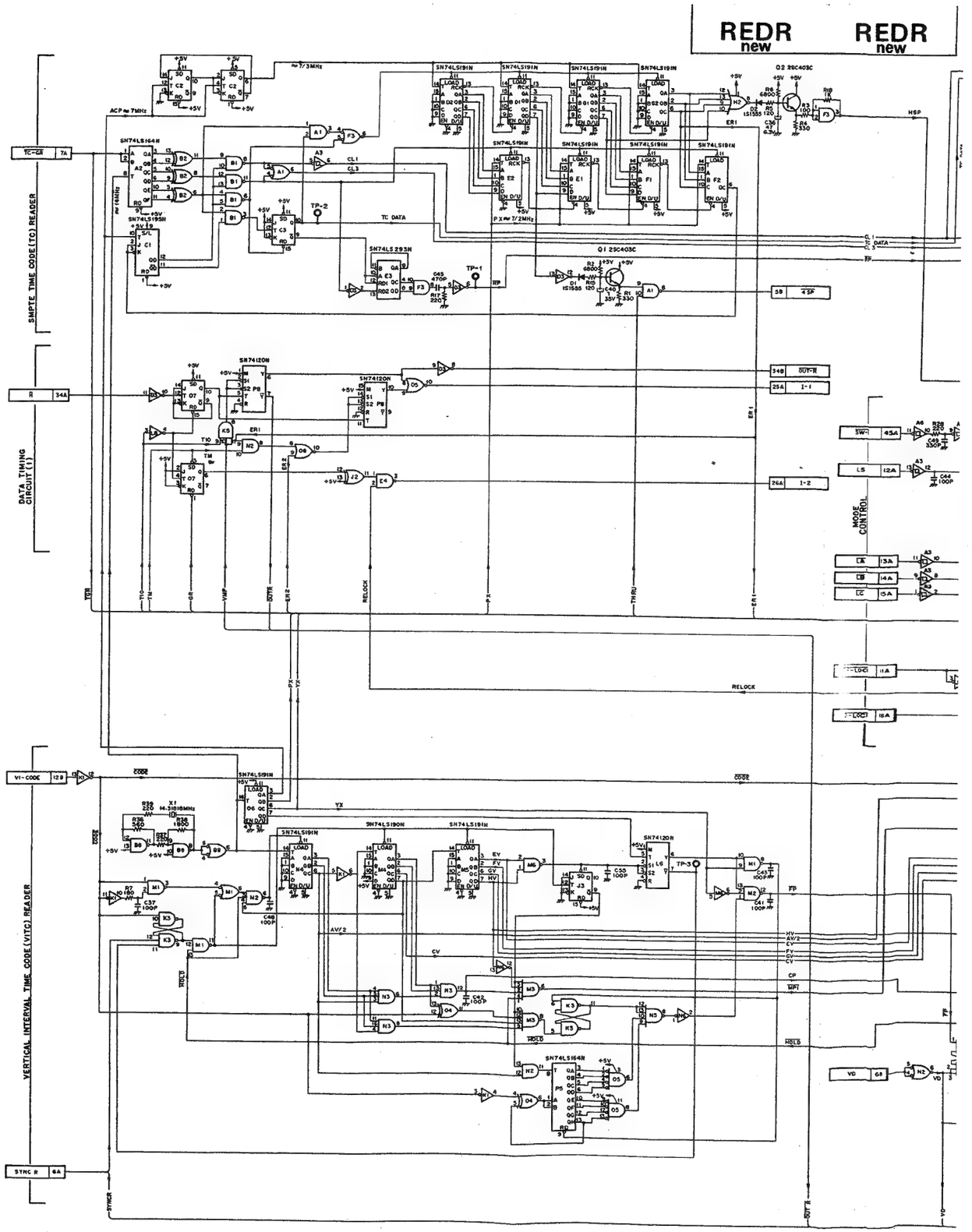


READ ADDRESS INPUTS	ADDRESS (when converted into decimal number) 0	1	2	3	4	5	6	7
A0	0	1	0	1	0	1	0	1
A1	0	0	1	1	0	0	1	1
A2	0	0	0	0	1	1	1	1

ADDRESS (when converted into decimal number)	A4	A3	MEMORIZED DATA SHOWN IN HEXADECIMAL							
0	0	0	00	00	00	00	00	00	00	00
8	0	1	00	00	00	00	00	00	00	00
16	1	0	03	F1	E1	82	D1	C1	82	81
24	1	1	A1	82	91	85	00	00	00	00

IC-A1	SN74LS00N	IC-L6	SN74120N
IC-A2	SN74LS164N	IC-L7	SN74LS109N
IC-A3	SN74LS14N	IC-L8	SN74LS04N
IC-A4	SN74LS259AN	IC-M1	SN74LS00N
IC-A5	SN74LS14N	IC-M2	SN74LS10N
IC-A6	SN74LS14N	IC-M3	SN74LS20N
IC-A7	SN74LS38N	IC-M4	SN74LS190N
IC-B1	SN74LS00N	IC-M5	SN74LS191N
IC-B2	SN74LS86N	IC-M6	SN74LS00N
IC-B3	SN74LS10N	IC-M7	SN74120N
IC-B4	SN74LS151N	IC-M8	SN74LS164N
IC-B5	SN74LS04N	IC-N1	SN74LS221N
IC-B6	SN74LS257N	IC-N2	SN74LS08N
IC-B7	SN74LS189N	IC-N3	SN74LS11N
IC-B8	SN74LS00N	IC-N4	SN74LS191N
IC-C1	SN74LS195N	IC-N5	SN74LS20N
IC-C2	SN74109N	IC-N6	SN74LS04N
IC-C3	SN74LS109N	IC-N7	SN74LS109N
IC-C4	SN74LS191N	IC-N8	SN74LS109N
IC-C5	MB7052-BV1	IC-O1	SN74LS257N
IC-C6	SN74LS257N	IC-O2	MB7051-BV3
IC-C7	SN74LS258N	IC-O3	SN74161N
IC-C8	SN74LS164N	IC-O4	SN74LS86N
IC-D1	SN74LS191N	IC-O5	SN7425N
IC-D2	SN74LS191N	IC-O6	SN74LS191N
IC-D3	SN74LS04N	IC-O7	SN74LS109N
IC-D4	SN74LS190N	IC-O8	SN74LS02N
IC-D5	SN74LS161N	IC-P1	SN74S189N
IC-D6	SN74S189N	IC-P2	SN74LS251N
IC-D7	SN74LS258N	IC-P3	SN74160N
IC-D8	SN7425N	IC-P4	SN74160N
IC-E1	SN74LS191N	IC-P5	SN74LS164N
IC-E2	SN74LS191N	IC-P6	SN74LS03N
IC-E3	SN74LS293N	IC-P7	SN74LS12N
IC-E4	SN74LS00N	IC-P8	SN74120N
IC-E5	SN74LS51N	IC-Q1	3258DC
IC-E6	SN74LS85N	IC-Q2	SN74LS107N
IC-E7	SN74LS257N	IC-Q3	SN74LS123N
IC-E8	SN74LS164N	IC-Q4	SN74161N
IC-F1	SN74LS191N	IC-Q5	SN74LS02N
IC-F2	SN74LS191N	IC-Q6	SN74LS20N
IC-F3	SN74LS08N	IC-Q7	SN74161N
IC-F4	SN74LS04N	IC-Q8	SN74LS12N
IC-F5	SN74LS12N		
IC-F6	SN74LS86N		
IC-F7	SN74LS257N		
IC-F8	SN74LS164N		
IC-G1	SN74LS191N		
IC-G2	SN74LS191N		
IC-G3	SN74S189N		
IC-G4	SN74LS258N		
IC-G5	SN74LS08N		
IC-G6	SN74LS283N		
IC-G7	SN74LS86N		
IC-G8	SN7425N		
IC-H2	SN7425N		
IC-H3	SN74LS194N		
IC-H4	SN74S189N		
IC-H5	SN74LS109N		
IC-H6	MB7052-BV2		
IC-H7	SN74LS00N		
IC-H8	SN74LS164N		
IC-I1	SN74LS190N		
IC-I2	SN74LS12N		
IC-I3	SN74LS257N		
IC-I4	SN74S189N		
IC-I5	SN74LS257N		
IC-I6	SN74LS27N		
IC-I7	SN74109N		
IC-I8	SN74LS20N		
IC-J1	SN74LS191N		
IC-J2	SN74LS86N		
IC-J3	SN74LS109N		
IC-J4	SN74LS164N		
IC-J5	SN7425N		
IC-J6	SN74161N		
IC-J7	SN74LS10N		
IC-J8	SN74LS04N		
IC-K1	SN74LS04N		
IC-K2	SN74LS20N		
IC-K3	SN74(LS)279N		
IC-K4	SN74LS195N		
IC-K5	SN74LS11N		
IC-K6	SN74LS27N		
IC-K7	SN74LS11N		
IC-K8	SN74LS02N		
IC-L1	SN74LS02N		
IC-L2	SN74LS32N		
IC-L3	SN74LS195N		
IC-L4	SN74LS32N		
IC-L5	SN74LS123N		

REDR
new



REDR new REDR new

C-L6 SN74120N
C-L7 SN74LS109N
C-L8 SN74LS04N
C-M1 SN74LS00N
C-M2 SN74LS10N

C-M3 SN74LS20N
C-M4 *SN74LS190N
C-M5 SN74LS191N
C-M6 SN74LS00N
C-M7 SN74120N

C-M8 SN74LS164N
C-N1 *SN74LS221N
C-N2 SN74LS08N
C-N3 SN74LS11N
C-N4 SN74LS191N

C-N5 SN74LS20N
C-N6 SN74LS04N
C-N7 SN74LS109N
C-N8 SN74LS109N
C-O1 SN74LS257N

C-O2 MB7051-BV3
C-O3 SN74161N
C-O4 SN74LS86N
C-O5 SN7425N
C-O6 SN74LS191N

C-O7 SN74LS109N
C-O8 SN74LS02N
C-P1 SN74S189N
C-P2 SN74LS251N
C-P3 SN74160N

C-P4 SN74160N
C-P5 SN74LS164N
C-P6 SN74LS03N
C-P7 SN74LS12N
C-P8 SN74120N

C-Q1 3258DC
C-Q2 SN74LS107N
C-Q3 SN74LS123N
C-Q4 SN74161N
C-Q5 SN74LS02N

C-Q6 SN74LS20N
C-Q7 SN74161N
C-Q8 SN74LS12N

SMPTE TIME CODE(TC) READER

DATA TIMING CIRCUIT(T)

VERTICAL INTERVAL TIME CODE(VITC) READER

REDR new REDR new

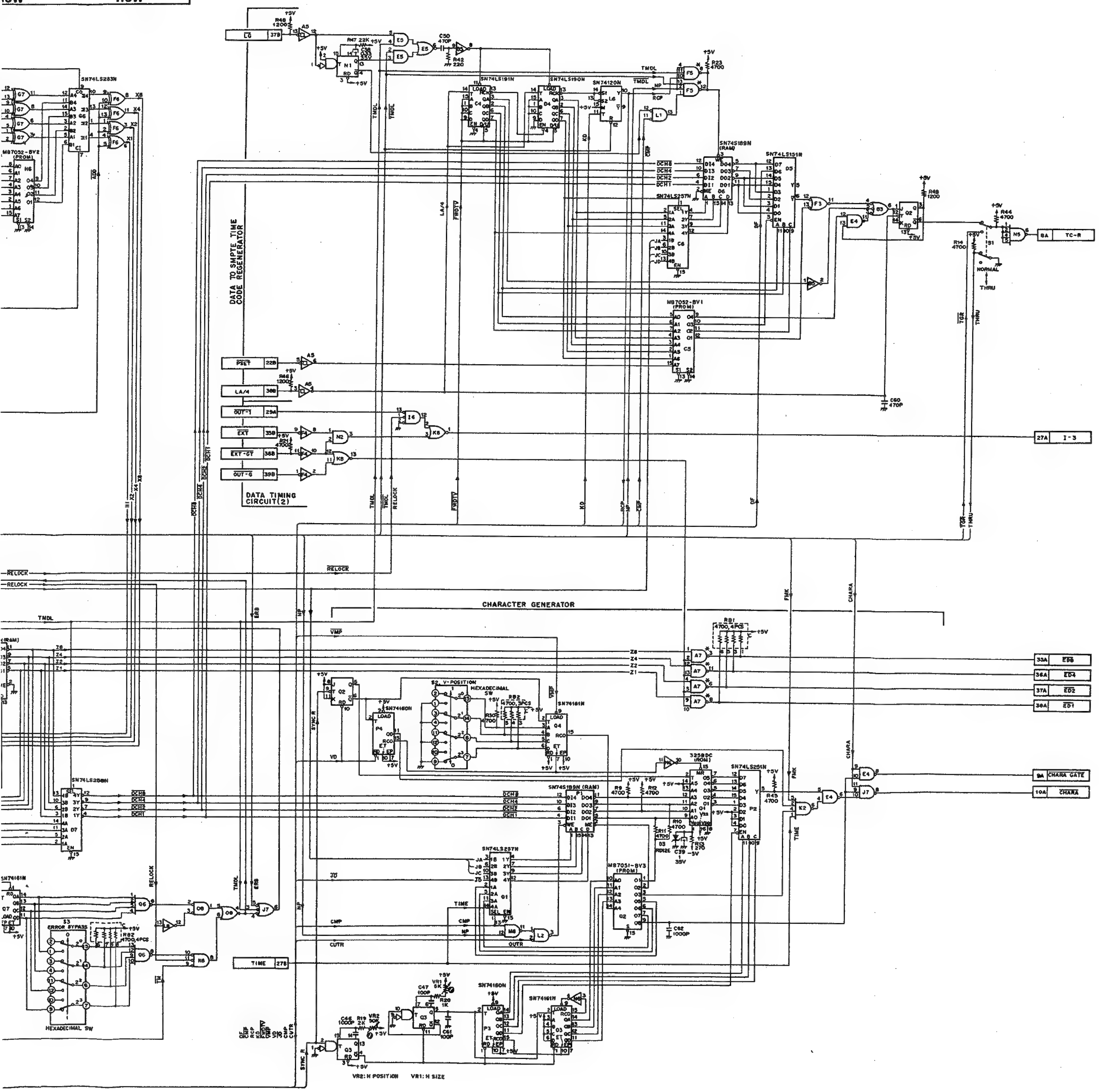
ADDER & SUBTRACTER OF DATA

DATA TO SMPTE TIME CODE REGENERATOR

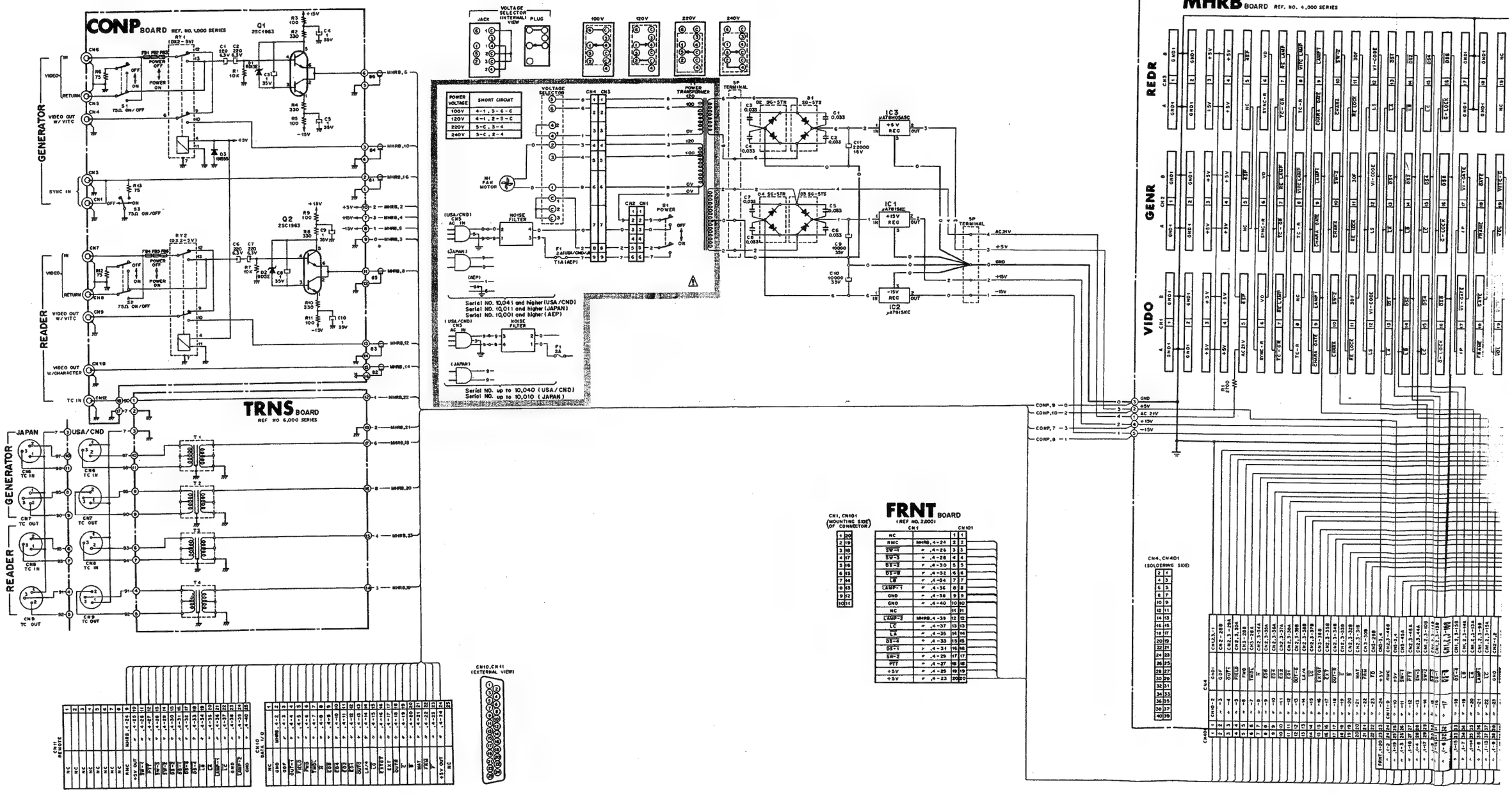
DATA TIMING CIRCUIT(2)

CHARACTER GENERATOR

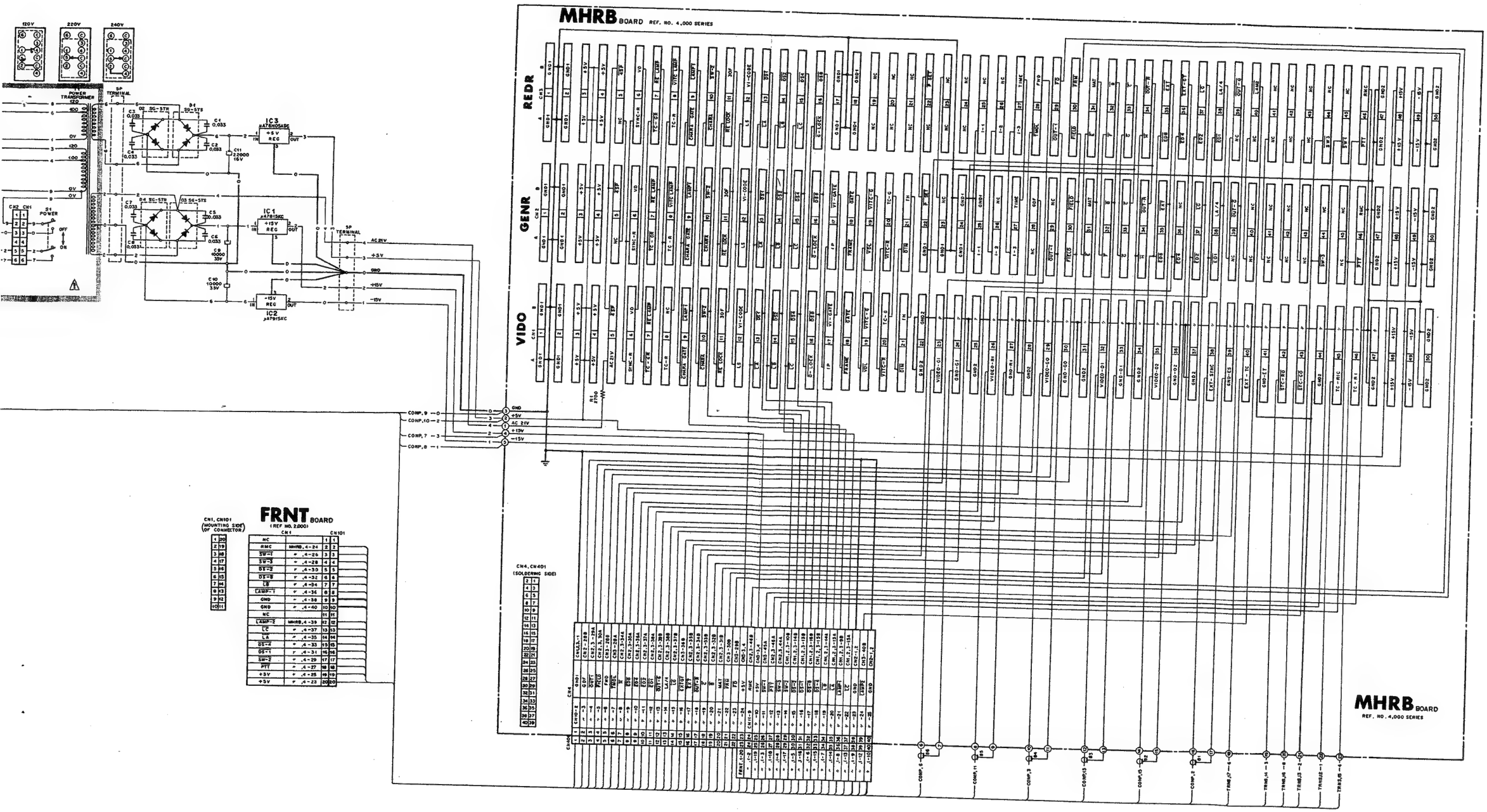
TC/VITC DATA SELECTOR & ERROR BYPASS CIRCUIT


DATA TO SMPTE TIME CODE REGENERATOR
DATA TIMING CIRCUIT(2)
CHARACTER GENERATOR
TC-R
I-3
CHARA GATE
CHARA
TIME
HEXADECIMAL SW
ERROR BYPASS
VR2: H POSITION
VR1: H SIZE

FRAME WIRING

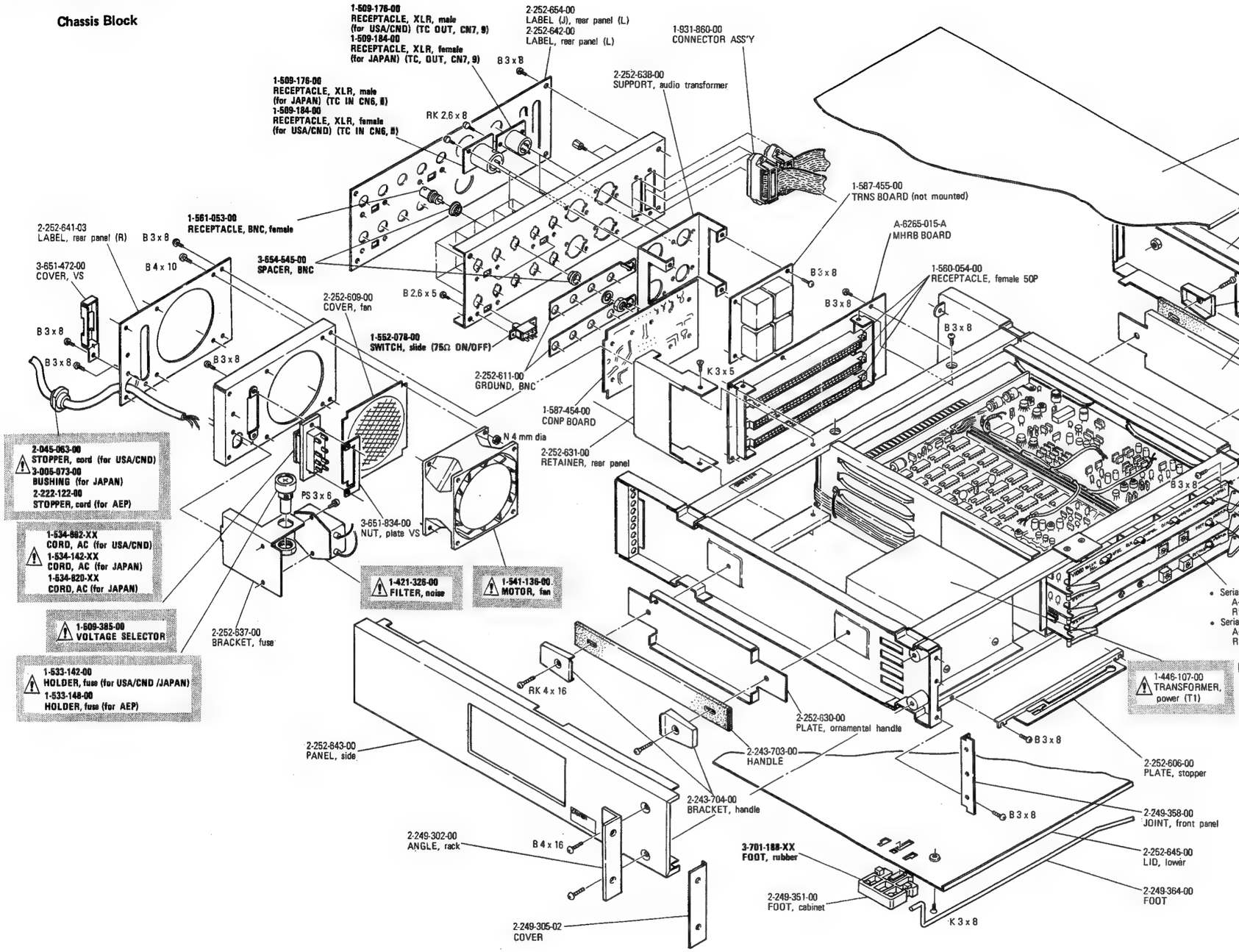


FRAME FRAME


MHRB BOARD REF. NO. 4,000 SERIES
REDR
GENR
VIDO
120V
220V
240V
POWER TRANSFORMER
SP TERMINAL
IC3 μA78M05ASPC +5V REG
IC1 μA7815KC +15V REG
IC2 μA7915KC -15V REG
SP TERMINAL
AC 21V
+5V
GND
+15V
-15V
SW POWER
OFF
ON
CN1, CN101 (MOUNTING SIDE OF CONNECTOR)
FRNT BOARD (REF NO. 2,000)
CN1
CN101
CN4, CN401 (SOLDERING SIDE)
MHRB BOARD REF. NO. 4,000 SERIES

5-2. EXPLODED VIEW

Chassis Block

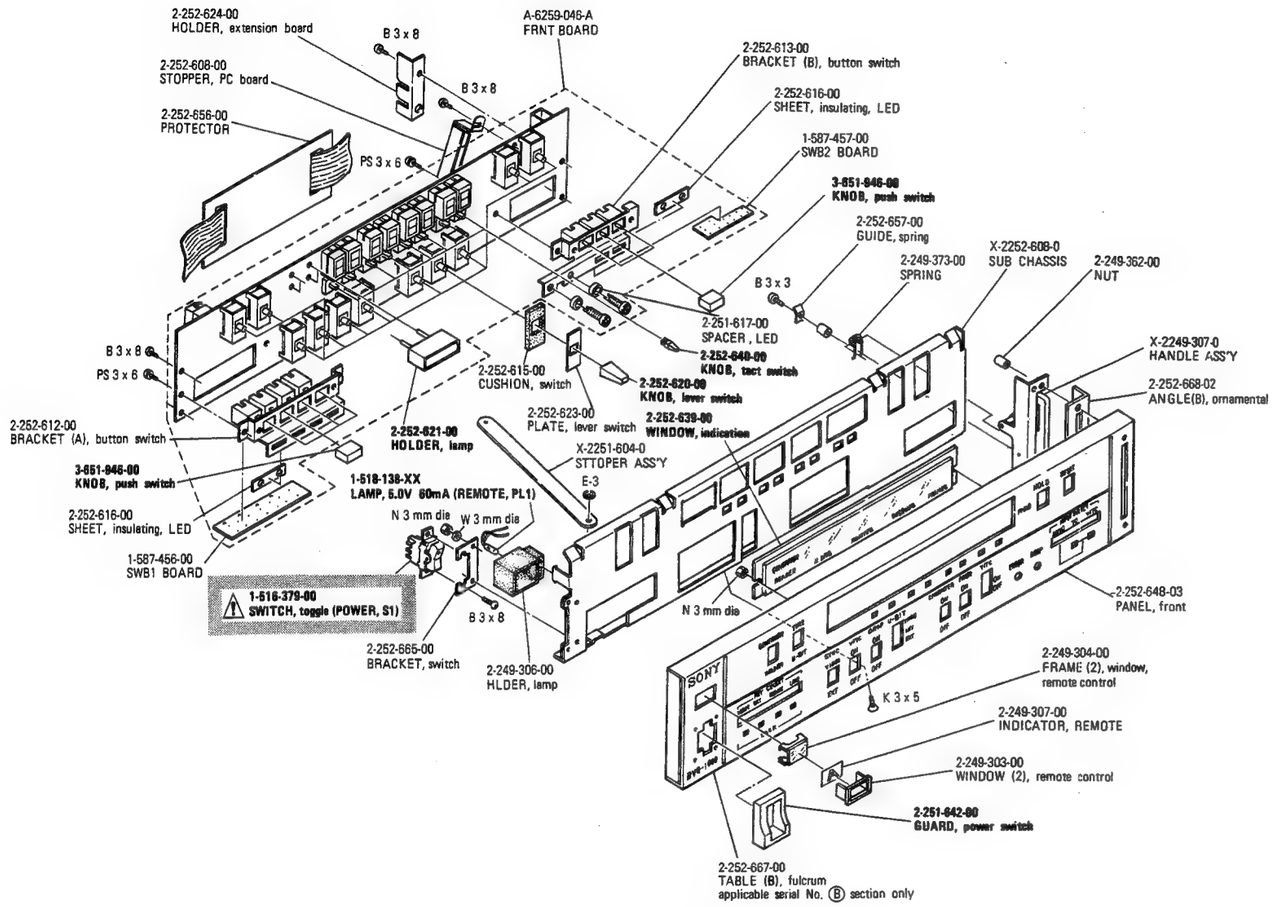


NOTE:

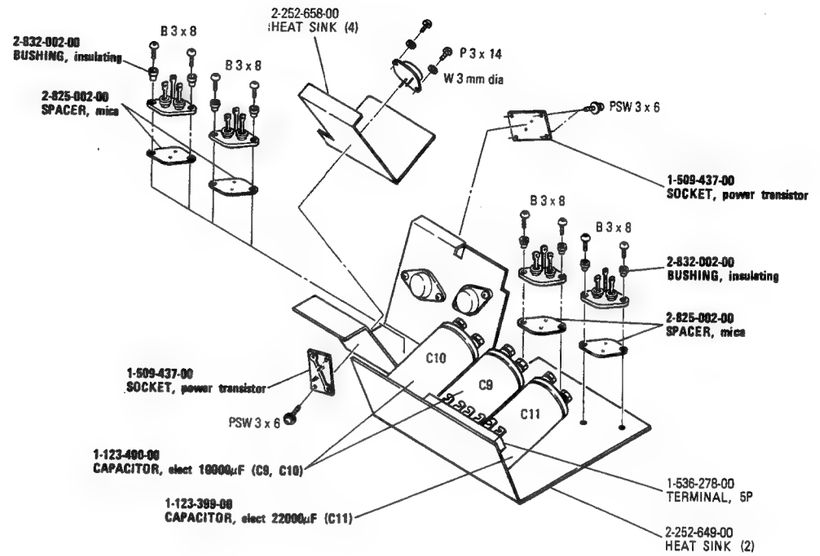
1. **The shaded and ⚠-marked components are critical to safety.**
   Replace only with same component as specified.
2. Parts printed in **Bold-Face type** are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.
3. Item with no part number and/or no description are not stocked because they are seldom required for routine service.
4.

	applicable serial Nos.
Ⓐ section	up to 10040 (USA/CND) up to 10010 (J)
Ⓑ section	10041 and higher (USA/CND) 10011 and higher (J)

Front Panel Block



Heat Sink Block



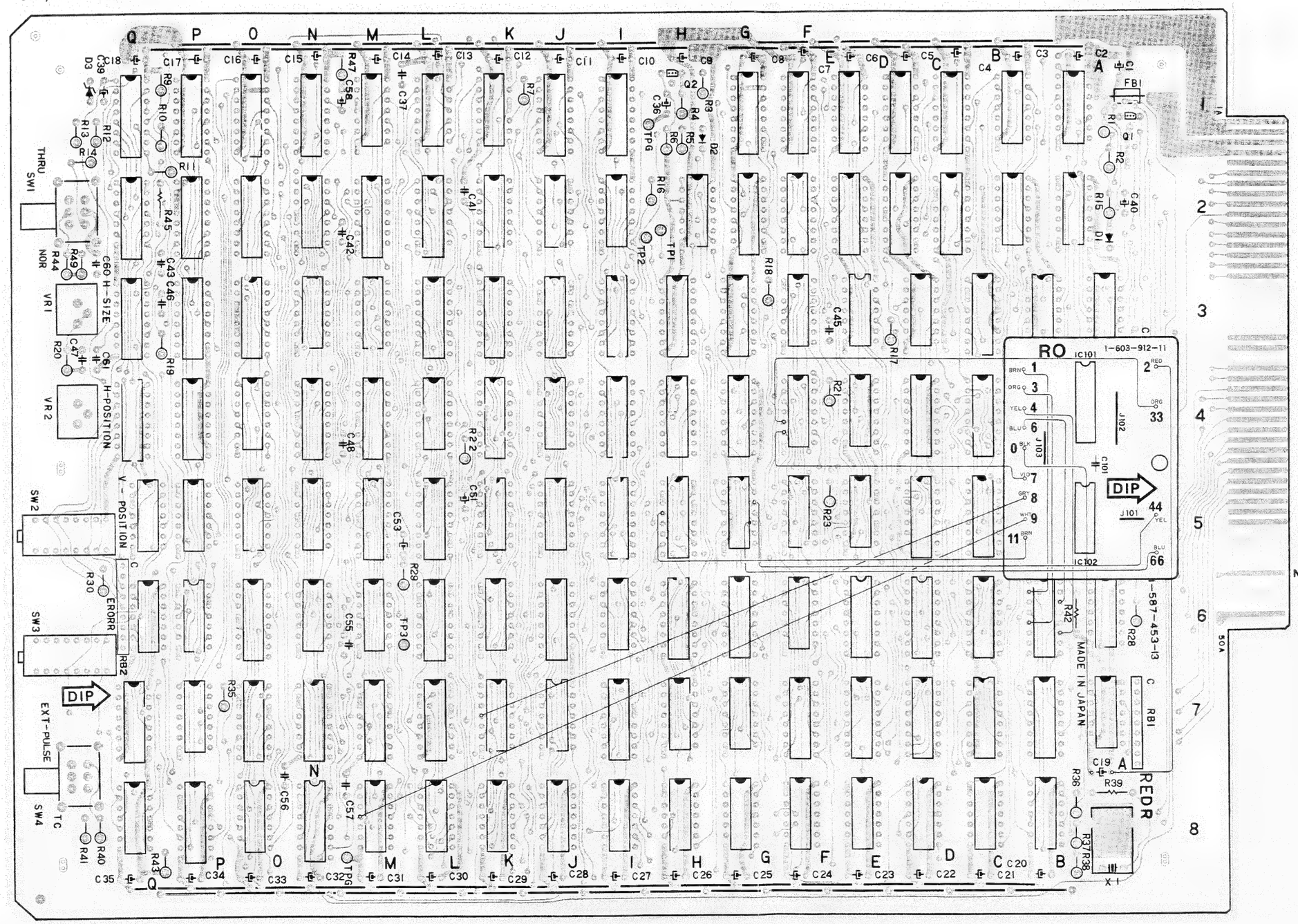
NOTE:

1. **The shaded and ⚠-marked components are critical to safety.**
   Replace only with same component as specified.
2. Parts printed in **Bold-Face type** are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.
3. Item with no part number and/or no description are not stocked because they are seldom required for routine service.
4.

	applicable serial Nos.
(A) section	up to 10040 (USA/CND) up to 10010 (J)
(B) section	10041 and higher (USA/CND) 10011 and higher (J)

Wiring between READER and RO Boards

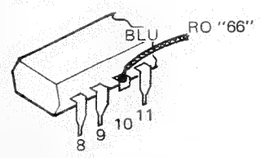
— Component Side —



Note: The blue colored wire, that goes out of RO board "66", should be soldered to IC-G5 pin 10 directly.

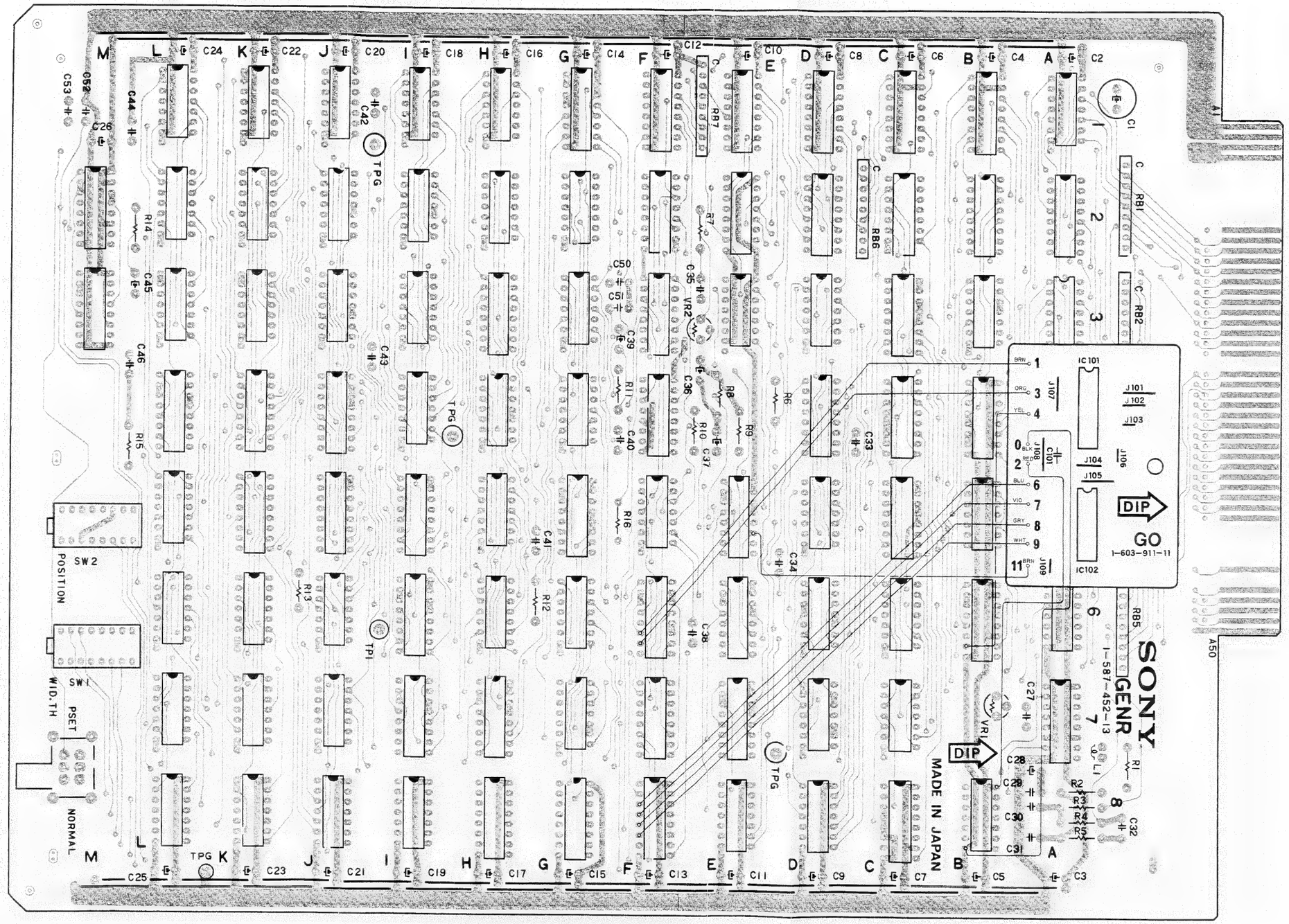
RO基板「66」から出ている青線はIC-G5の10番ピンに直接半田付すること。

IC-G5



Wiring between GENERATOR and GO Boards

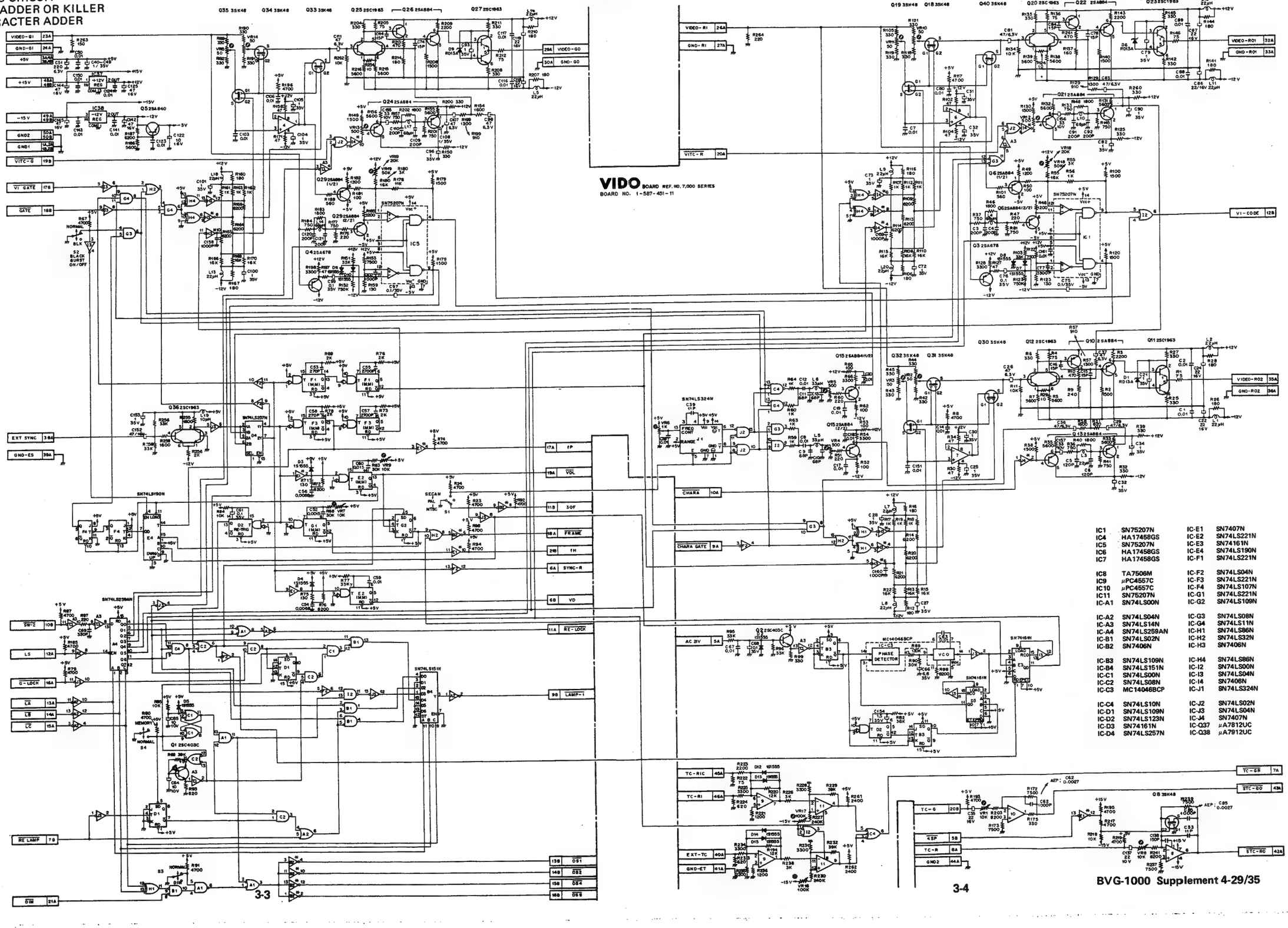
– Component Side –



VIDO BOARD REF. NO. 7000 SERIES **BOARD NO. 1-587-451-11**

VIDEO CIRCUIT
VITC ADDER OR KILLER
CHARACTER ADDER

VIDO former | VIDO former

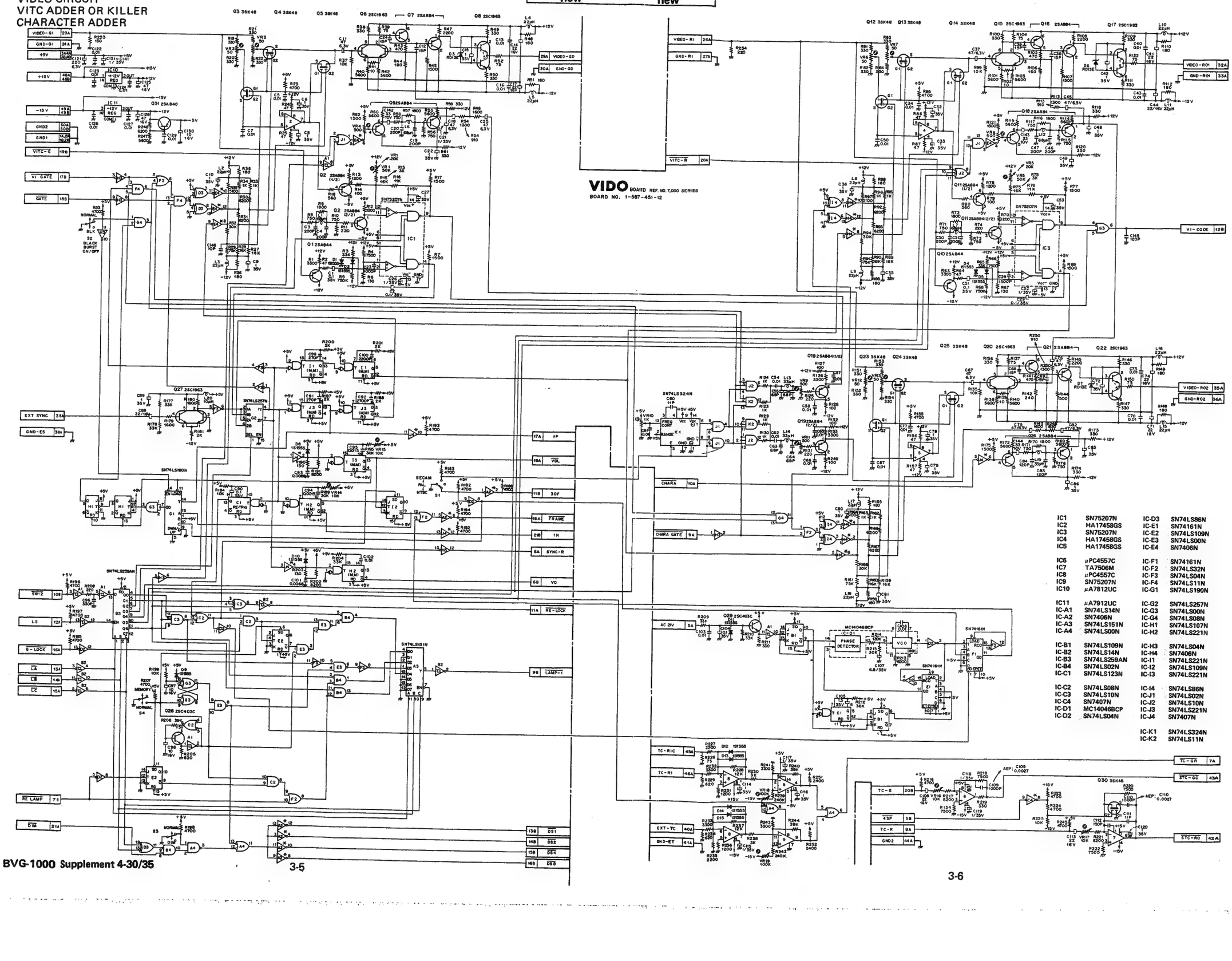


IC1	SN75207N	IC-E1	SN7407N
IC4	HA17458GS	IC-E2	SN74LS221N
IC5	SN75207N	IC-E3	SN74161N
IC6	HA17458GS	IC-E4	SN74LS190N
IC7	HA17458GS	IC-F1	SN74LS221N
IC8	TA7506M	IC-F2	SN74LS04N
IC9	μPC4557C	IC-F3	SN74LS221N
IC10	μPC4557C	IC-F4	SN74LS107N
IC11	SN75207N	IC-G1	SN74LS221N
IC-A1	SN74LS00N	IC-G2	SN74LS109N
IC-A2	SN74LS04N	IC-G3	SN74LS08N
IC-A3	SN74LS14N	IC-G4	SN74LS11N
IC-A4	SN74LS259AN	IC-H1	SN74LS86N
IC-B1	SN74LS02N	IC-H2	SN74LS32N
IC-B2	SN7406N	IC-H3	SN7406N
IC-B3	SN74LS109N	IC-H4	SN74LS86N
IC-B4	SN74LS151N	IC-I2	SN74LS00N
IC-C1	SN74LS00N	IC-I3	SN74LS04N
IC-C2	SN74LS08N	IC-I4	SN7406N
IC-C3	MC14046BCP	IC-J1	SN74LS324N
IC-C4	SN74LS10N	IC-J2	SN74LS02N
IC-D1	SN74LS109N	IC-J3	SN74LS04N
IC-D2	SN74LS123N	IC-J4	SN7407N
IC-D3	SN74161N	IC-Q37	μA7812UC
IC-D4	SN74LS257N	IC-Q38	μA7912UC

VIDO BOARD REF. NO. 7000 SERIES **BOARD NO. 1-587-451-12**

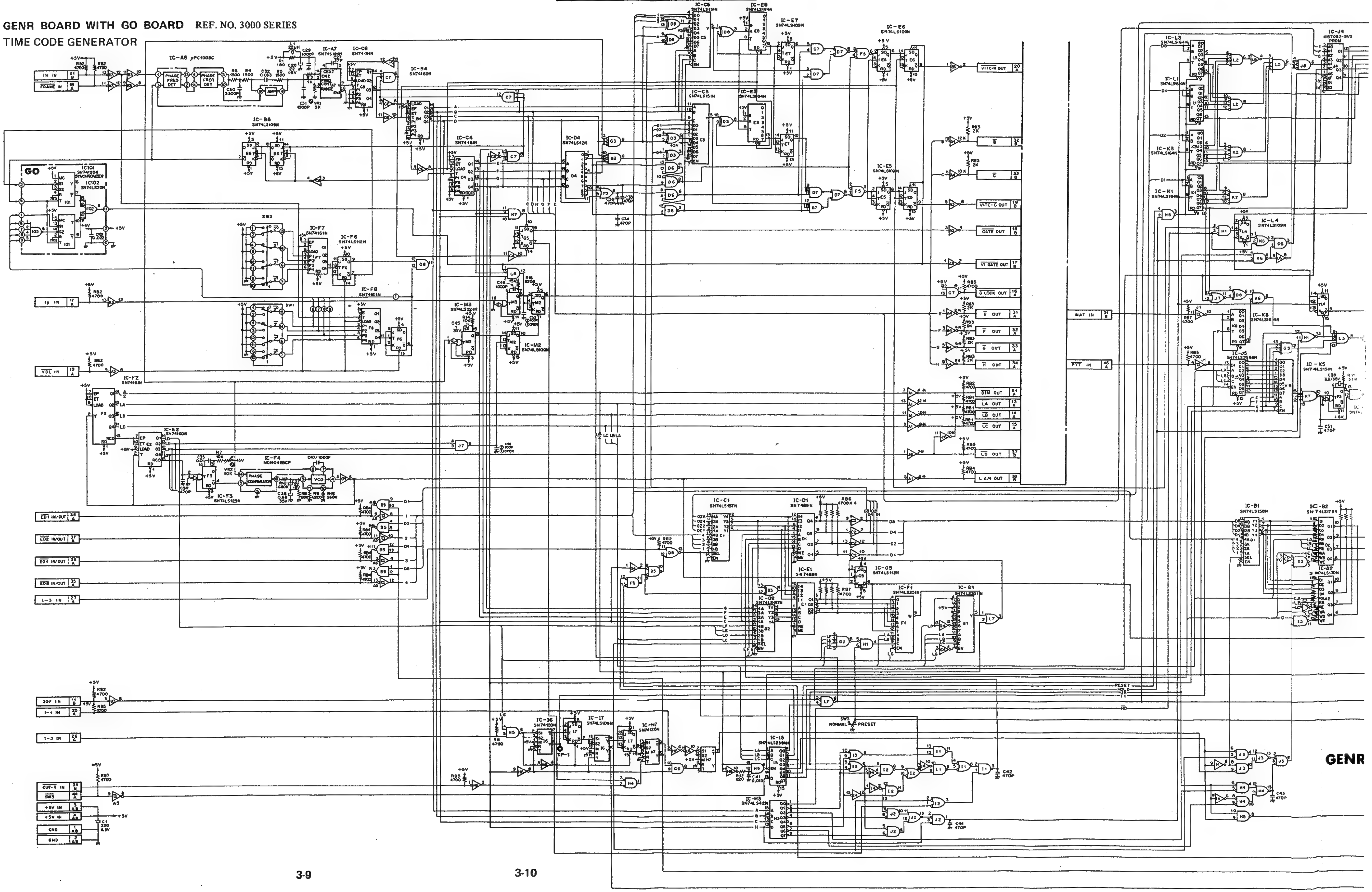
VIDEO CIRCUIT
VITC ADDER OR KILLER
CHARACTER ADDER

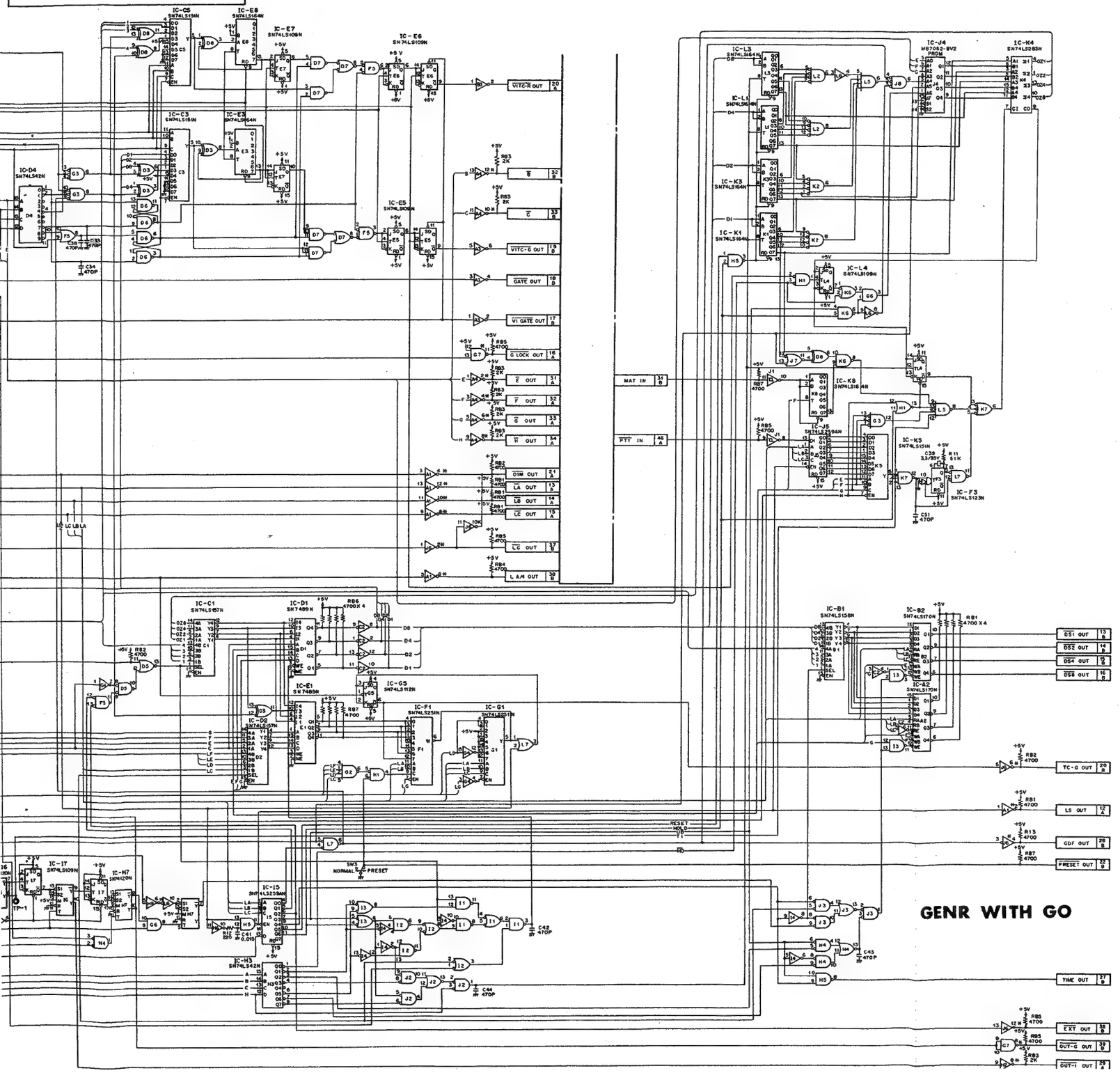
VIDO new VIDO new



GENR BOARD WITH GO BOARD REF. NO. 3000 SERIES

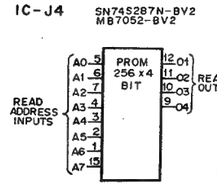
TIME CODE GENERATOR





GENR WITH GO

IC-J4 SN74S287N-BV2 MB7052-BV2



ADDRESS(when converted into decimal number)	A7	A6	A5	A4	MEMORIZED DATA SHOWN IN HEXADECIMAL													
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0
32	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	0	1	0	0	6	D	6	A	6	A	6	D	6	D	6	A	5	A	C	D
80	0	1	0	1	6	D	6	A	6	A	6	D	6	D	6	A	6	A	C	D
96	0	1	1	0	6	D	6	A	6	A	6	D	B	D	6	A	6	A	C	D
112	0	1	1	1	6	D	6	A	6	A	6	D	B	D	6	A	6	A	C	D
128	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
144	1	0	0	1	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
176	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
192	1	1	0	0	6	D	6	A	6	A	C	D	6	D	6	A	6	A	6	D
208	1	1	0	1	8	D	6	A	6	A	6	D	0	0	0	0	0	0	0	0
224	1	1	1	0	B	D	6	A	6	A	C	D	6	D	6	A	6	A	6	D
240	1	1	1	1	6	D	6	A	6	A	6	D	0	0	0	0	0	0	0	0

ADDRESS(when converted into decimal number)

IC-A1	SN74LS05N	IC-G3	SN74LS27N
IC-A2	SN74LS170N	IC-G4	SN74LS04N
IC-A3	SN74LS04N	IC-G5	SN74LS112N
IC-A4	SN7406N	IC-G6	SN74LS08N
IC-A5	SN74LS14N	IC-G7	SN74LS03N
IC-A6	μPC1008C, MC4044P	IC-H1	SN74LS02N
IC-A7	SN74S124N	IC-H2	SN7406N
IC-B1	SN74LS158N	IC-H3	SN74LS42N
IC-B2	SN74LS170N	IC-H4	SN74LS02N
IC-B3	SN74LS04N	IC-H5	SN74LS00N
IC-B4	SN74160N	IC-H6	SN74LS04N
IC-B5	SN74LS38N	IC-H7	SN74120N
IC-B6	SN74LS109N	IC-I1	SN74LS00N
IC-B8	SN74LS00N	IC-I2	SN74LS00N
IC-C1	SN74LS157N	IC-I3	SN74LS00N
IC-C2	SN74LS04N	IC-I4	SN74LS04N
IC-C3	SN74LS151N	IC-I5	SN74LS259AN
IC-C4	SN74161N	IC-I6	SN74120N
IC-C5	SN74LS151N	IC-I7	SN74LS109N
IC-C6	SN74LS04N	IC-J1	SN74LS14N
IC-C7	SN74LS11N	IC-J2	SN74LS02N
IC-C8	SN74161N	IC-J3	SN74LS02N
IC-D1	SN7489N	IC-J4	MB7052-BV2
IC-D2	SN74LS157N	IC-J5	SN74LS259AN
IC-D3	SN74LS86N	IC-J6	SN74LS05N
IC-D4	SN74LS42N	IC-J7	SN74LS08N
IC-D5	SN74LS02N	IC-J8	SN74LS27N
IC-D6	SN74LS00N	IC-K1	SN74LS164N
IC-D7	SN74LS51N	IC-K2	SN7425N
IC-D8	SN74LS86N	IC-K3	SN74LS164N
IC-E1	SN7489N	IC-K4	SN74LS283N
IC-E2	SN74160N	IC-K5	SN74LS151N
IC-E3	SN74LS164N	IC-K6	SN74LS00N
IC-E5	SN74LS109N	IC-K7	SN74LS10N
IC-E6	SN74LS109N	IC-K8	SN74LS164N
IC-E7	SN74LS109N	IC-L1	SN74LS164N
IC-E8	SN74LS164N	IC-L2	SN7425N
IC-F1	SN74LS251N	IC-L3	SN74LS164N
IC-F2	SN74161N	IC-L4	SN74LS109N
IC-F3	SN74LS123N	IC-L5	SN74LS20N
IC-F4	MC14046BCP	IC-L6	SN74LS04N
IC-F5	SN74LS32N	IC-L7	SN74LS32N
IC-F6	SN74LS112N	IC-L8	SN74LS11N
IC-F7	SN74161N	IC-M2	SN74LS109N
IC-F8	SN74161N	IC-M3	SN74LS221N
IC-G1	SN74LS251N		
IC-G2	SN74LS20N	IC101	SN74120N
		IC102	SN74LS20N

NOTE:
1. THE PARTS MARKED BY ① OR ② HAVE DIFFERENT VALUE ACCORDING TO THE PRODUCTION SERIAL NUMBER. THE APPLICABLE SERIAL NUMBER IS SHOWN BELOW.

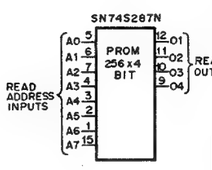
① UP TO 10,040 (USA/CND)
UP TO 10,010 (JAPAN)

② 10,041 AND HIGHER (USA/CND)
10,010 AND HIGHER (JAPAN)

REDR BOARD WITH RO BOARD REF. NO. 5000 SERIES BOARD NO. 1-587-453-11

TIME CODE READER
CHARACTER GENERATOR

IC-C5

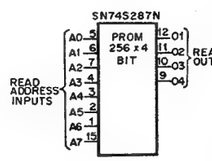


TRUTH TABLE
SN74S287N1(BV-1), PROM, 256 x 4 BIT

READ ADDRESS INPUTS	ADDRESS (when converted into decimal number) 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A0	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
A1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
A2	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
A3	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

ADDRESS (when converted into decimal number)	A7	A6	A5	A4	MEMORIZED DATA SHOWN IN HEXADECIMAL
0	0	0	0	0	1 1 1 1 1 1 1 1 3 3 3 3 1 1 1 1
16	0	0	0	1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
32	0	0	1	0	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
48	0	0	1	1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
64	0	1	0	0	5 5 4 4 4 4 4 4 4 4 4 4 4 4 5 4
80	0	1	0	1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
96	0	1	1	0	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
112	0	1	1	1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
128	1	0	0	0	1 1 1 1 1 1 1 1 3 3 3 3 1 1 1 1
144	1	0	0	1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
160	1	0	1	0	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
176	1	0	1	1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 9
192	1	1	0	0	5 5 4 4 4 4 4 4 4 4 4 4 4 4 5 4
208	1	1	0	1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
224	1	1	1	0	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
240	1	1	1	1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

IC-H6

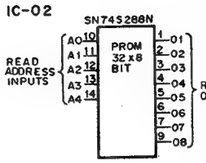


TRUTH TABLE
SN74S287N2(BV-2), PROM, 256 x 4 BIT

READ ADDRESS INPUTS	ADDRESS (when converted into decimal number) 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A0	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
A1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
A2	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
A3	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

ADDRESS (when converted into decimal number)	A7	A6	A5	A4	MEMORIZED DATA SHOWN IN HEXADECIMAL
0	0	0	0	0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
16	0	0	0	1	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
32	0	0	1	0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
48	0	0	1	1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
64	0	1	0	0	6 D 6 A 6 A 6 D 6 D 6 A 6 A C D
80	0	1	0	1	6 D 6 A 6 A 6 D 6 D 6 A 6 A C D
96	0	1	1	0	6 D 6 A 6 A 6 D B D 6 A 6 A C D
112	0	1	1	1	6 D 6 A 6 A 6 D 8 D 6 A 6 A C D
128	1	0	0	0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
144	1	0	0	1	8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
160	1	0	1	0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
176	1	0	1	1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
192	1	1	0	0	6 D 6 A 6 A C D 6 D 6 A 6 A 6 D
208	1	1	0	1	8 D 6 A 6 A 6 D 0 0 0 0 0 0 0 0
224	1	1	1	0	8 D 6 A 6 A C D 6 D 6 A 6 A 6 D
240	1	1	1	1	6 D 6 A 6 A 6 D 0 0 0 0 0 0 0 0

IC-02

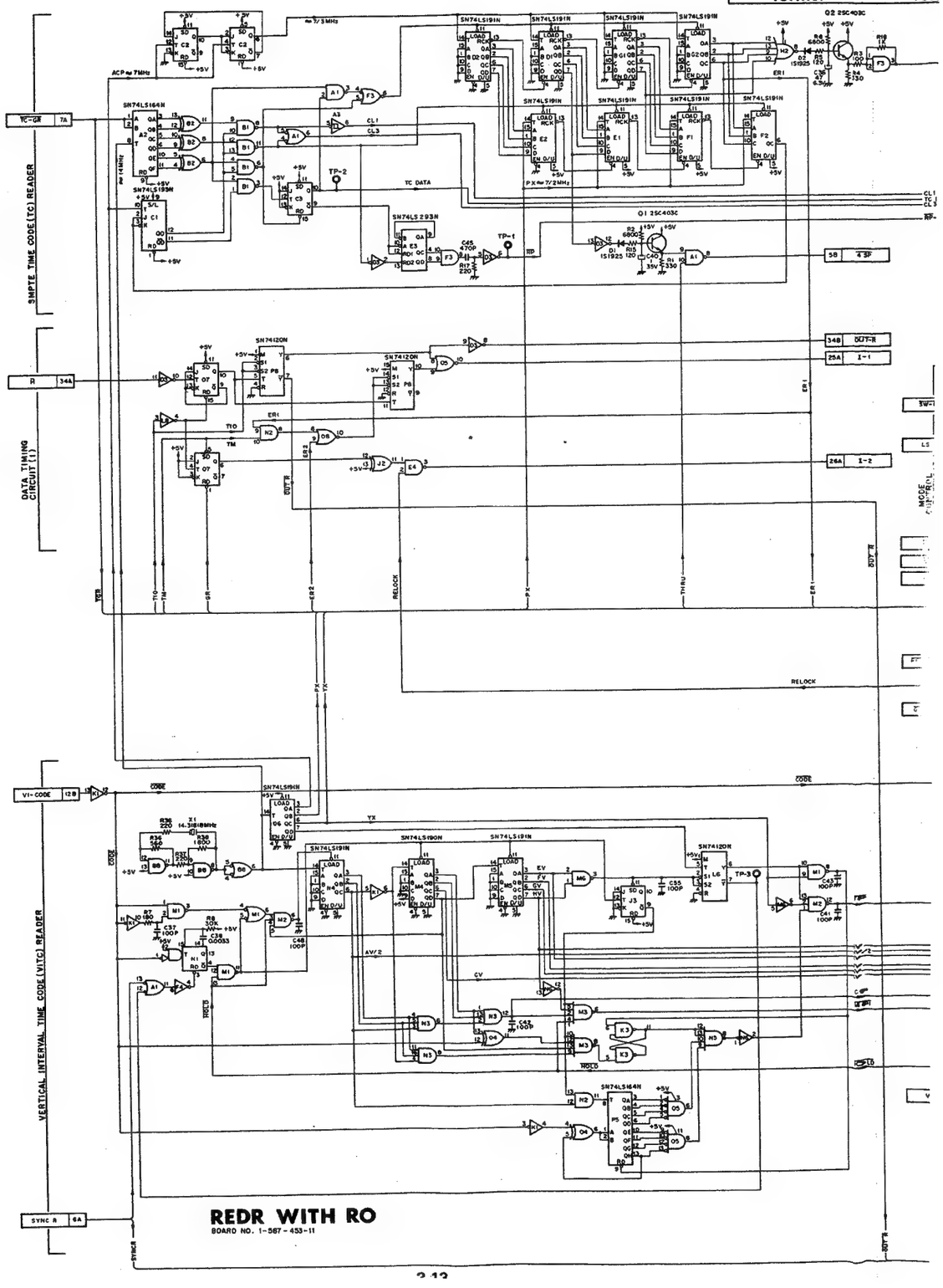


TRUTH TABLE
SN74S288N1(BV-3), PROM, 32 x 8 BIT

READ ADDRESS INPUTS	ADDRESS (when converted into decimal number) 0	1	2	3	4	5	6	7
A0	0	1	0	1	0	1	0	1
A1	0	0	1	1	0	0	1	1
A2	0	0	0	0	1	1	1	1

ADDRESS (when converted into decimal number)	A4	A3	MEMORIZED DATA SHOWN IN HEXADECIMAL
0	0	0	00 00 00 00 00 00 00 00
8	0	1	00 00 00 00 00 00 00 00
16	1	0	03 F1 E1 82 D1 C1 82 B1
24	1	1	A1 82 91 85 00 00 00 00

IC-A1	SN74LS00N	IC-L6	SN74120N
IC-A2	SN74LS164N	IC-L7	SN74LS109N
IC-A3	SN74LS14N	IC-L8	SN74LS04N
IC-A4	SN74LS259AN	IC-M1	SN74LS00N
IC-A5	SN74LS14N	IC-M2	SN74LS10N
IC-A6	SN74LS14N	IC-M3	SN74LS20N
IC-A7	SN74LS38N	IC-M4	SN74LS190N
IC-B1	SN74LS00N	IC-M5	SN74LS191N
IC-B2	SN74LS86N	IC-M6	SN74LS00N
IC-B3	SN74LS10N	IC-M7	SN74120N
IC-B4	SN74LS151N	IC-M8	SN74LS164N
IC-B5	SN74LS04N	IC-N1	SN74LS221N
IC-B6	SN74LS257N	IC-N2	SN74LS08N
IC-B7	SN74LS189N	IC-N3	SN74LS11N
IC-B8	SN74LS00N	IC-N4	SN74LS191N
IC-C1	SN74LS195N	IC-N5	SN74LS20N
IC-C2	SN74LS109N	IC-N6	SN74LS04N
IC-C3	SN74LS109N	IC-N7	SN74LS109N
IC-C4	SN74LS191N	IC-N8	SN74LS109N
IC-C5	SN74S287N 1 (BV-1)	IC-O1	SN74LS257N
IC-C6	SN74LS257N	IC-O2	SN74S288N 1 (BV-3)
IC-C7	SN74LS258N	IC-O3	SN74161N
IC-C8	SN74LS164N	IC-O4	SN74LS86N
IC-D1	SN74LS191N	IC-O5	SN7425N
IC-D2	SN74LS191N	IC-O6	SN74LS191N
IC-D3	SN74LS04N	IC-O7	SN74LS109N
IC-D4	SN74LS190N	IC-O8	SN74LS02N
IC-D5	SN74LS151N	IC-P1	SN74S189N
IC-D6	SN74S189N	IC-P2	SN74LS251N
IC-D7	SN74LS258N	IC-P3	SN74160N
IC-D8	SN7425N	IC-P4	SN74160N
IC-E1	SN74LS191N	IC-P5	SN74LS164N
IC-E2	SN74LS191N	IC-P6	SN74LS03N
IC-E3	SN74LS293N	IC-P7	SN74LS12N
IC-E4	SN74LS00N	IC-P8	SN74120N
IC-E5	SN74LS51N	IC-Q1	3258DC
IC-E6	SN74LS85N	IC-Q2	SN74LS107N
IC-E7	SN74LS257N	IC-Q3	SN74LS123N
IC-E8	SN74LS164N	IC-Q4	SN74161N
IC-F1	SN74LS191N	IC-Q5	SN74LS02N
IC-F2	SN74LS191N	IC-Q6	SN74LS20N
IC-F3	SN74LS08N	IC-Q7	SN74161N
IC-F4	SN74LS04N	IC-Q8	SN74LS12N
IC-F5	SN74LS12N	IC101	SN74LS138N
IC-F6	SN74LS86N	IC102	SN74LS11N
IC-F7	SN74LS257N		
IC-F8	SN74LS164N		
IC-G1	SN74LS191N		
IC-G2	SN74LS191N		
IC-G3	SN74S189N		
IC-G4	SN74LS258N		
IC-G5	SN74LS08N		
IC-G6	SN74LS283N		
IC-G7	SN74LS86N		
IC-G8	SN7425N		
IC-H2	SN7425N		
IC-H3	SN74LS194N		
IC-H4	SN74S189N		
IC-H5	SN74LS109N		
IC-H6	SN74287N 2 (BV-2)		
IC-H7	SN74LS00N		
IC-H8	SN74LS164N		
IC-I1	SN74LS190N		
IC-I2	SN74LS12N		
IC-I3	SN74LS257N		
IC-I4	SN74S189N		
IC-I5	SN74LS257N		
IC-I6	SN74LS27N		
IC-I7	SN74LS109N		
IC-I8	SN74LS20N		
IC-J1	SN74LS191N		
IC-J2	SN74LS86N		
IC-J3	SN74LS109N		
IC-J4	SN74LS164N		
IC-J5	SN7425N		
IC-J6	SN74161N		
IC-J7	SN74LS10N		
IC-J8	SN74LS04N		
IC-K1	SN74LS04N		
IC-K2	SN74LS20N		
IC-K3	SN74(LS)279N		
IC-K4	SN74LS195N		
IC-K6	SN74LS27N		
IC-K7	SN74LS11N		
IC-K8	SN74LS02N		
IC-L1	SN74LS02N		
IC-L2	SN74LS32N		
IC-L3	SN74LS195N		
IC-L4	SN74LS32N		
IC-L5	SN74LS123N		



IC-L6 SN74120N
IC-L7 SN74LS109N
IC-L8 SN74LS04N
IC-M1 SN74LS00N
IC-M2 SN74LS10N

IC-M3 SN74LS20N
IC-M4 SN74LS190N
IC-M5 SN74LS191N
IC-M6 SN74LS00N
IC-M7 SN74120N

IC-M8 SN74LS164N
IC-N1 SN74LS221N
IC-N2 SN74LS08N
IC-N3 SN74LS11N
IC-N4 SN74LS191N

IC-N5 SN74LS20N
IC-N6 SN74LS04N
IC-N7 SN74LS109N
IC-N8 SN74LS109N
IC-O1 SN74LS257N

IC-O2 SN74S288N 1 (BV-3)
IC-O3 SN74161N
IC-O4 SN74LS86N
IC-O5 SN7425N
IC-O6 SN74LS191N

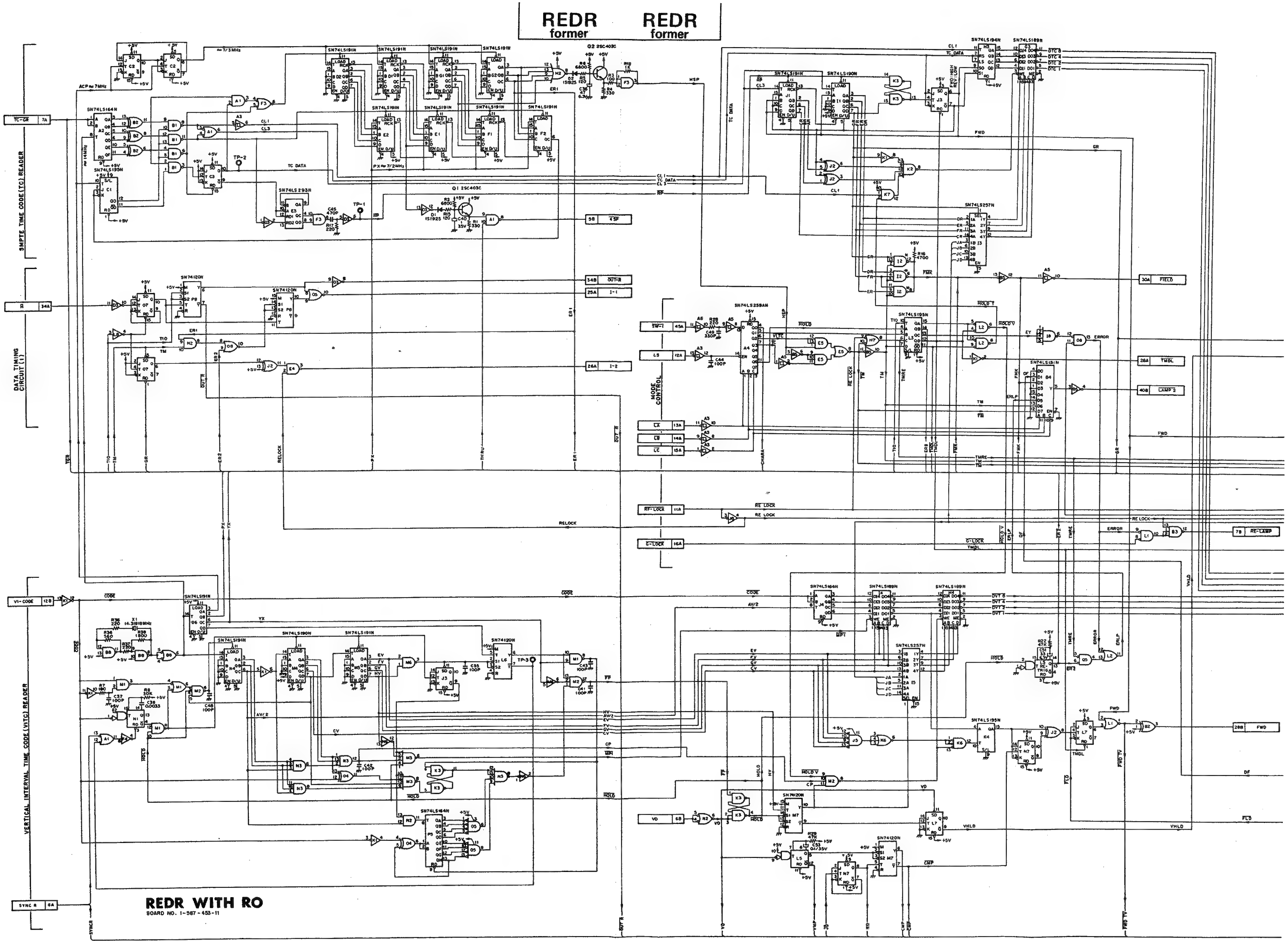
IC-O7 SN74LS109N
IC-O8 SN74LS02N
IC-P1 SN74S189N
IC-P2 SN74LS251N
IC-P3 SN74160N

IC-P4 SN74160N
IC-P5 SN74LS164N
IC-P6 SN74LS03N
IC-P7 SN74LS12N
IC-P8 SN74120N

IC-Q1 3258DC
IC-Q2 SN74LS107N
IC-Q3 SN74LS123N
IC-Q4 SN74161N
IC-Q5 SN74LS02N

IC-Q6 SN74LS20N
IC-Q7 SN74161N
IC-Q8 SN74LS12N

IC101 SN74LS138N
IC102 SN74LS11N



REDR former

REDR former

ADDER & SUBTRACTER OF DATA

DATA TO SMPTE TIME CODE REGENERATOR

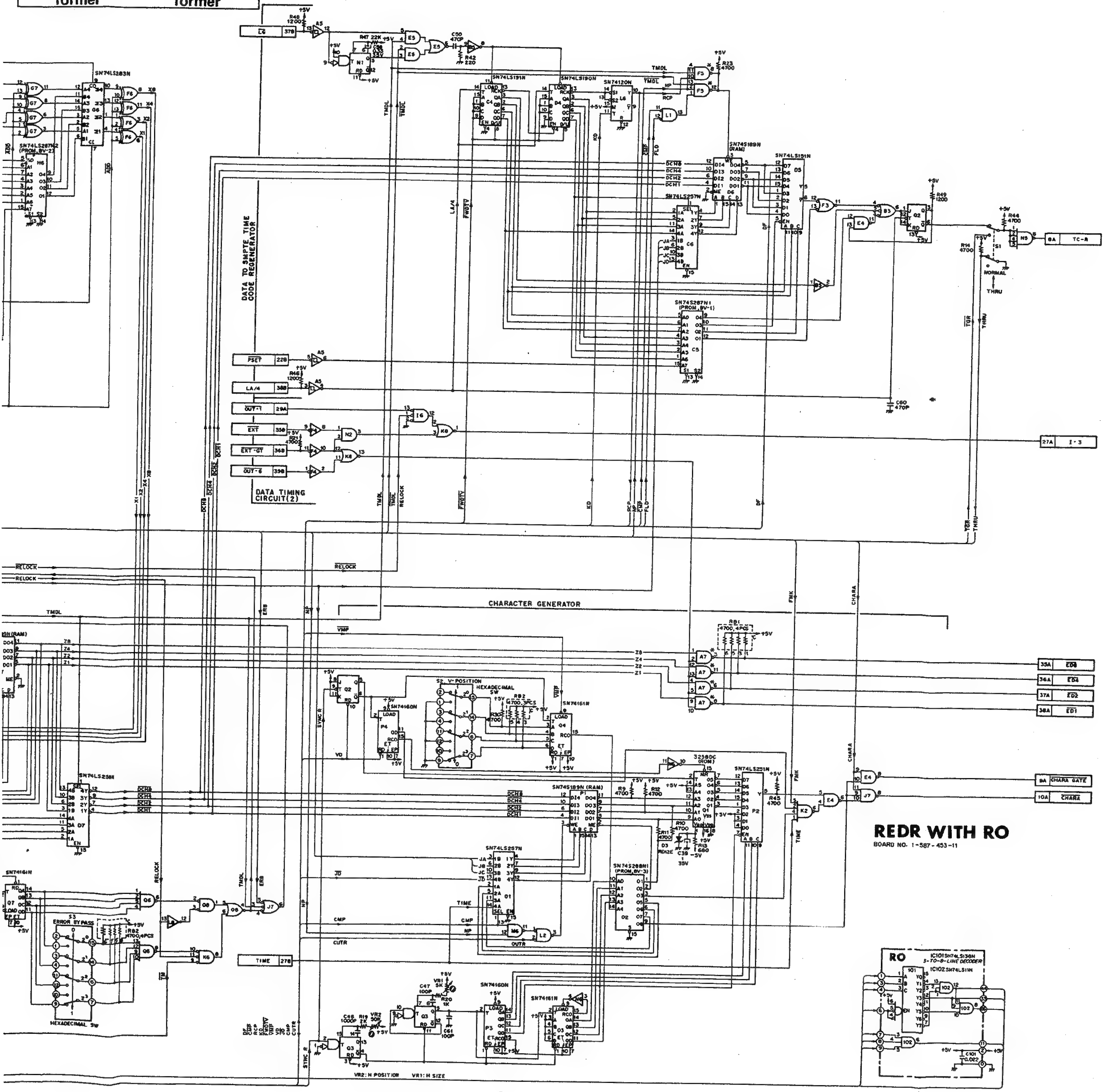
DATA TIMING CIRCUIT(2)

CHARACTER GENERATOR

TC/VITC DATA SELECTOR & ERROR BYPASS CIRCUIT

REDR WITH R

BOARD NO. 1587-[illegible]53-11



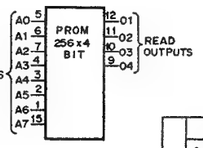
REDR WITH RO

BOARD NO. 1-587-453-11

REDR BOARD WITH RO BOARD REF. NO. 5000 SERIES BOARD NO. 1-587-453-12, -13

TIME CODE READER
CHARACTER GENERATOR

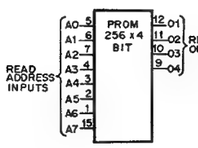
IC-C5 SN74S287N-BV1 MB7052-BV1



READ ADDRESS INPUTS	ADDRESS (when converted into decimal number) 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A0	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
A1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
A2	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
A3	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

ADDRESS (when converted into decimal number)	A7	A6	A5	A4	MEMORIZED DATA SHOWN IN HEXADECIMAL
0	0	0	0	0	1 1 1 1 1 1 1 1 3 3 3 3 1 1 1 1
16	0	0	0	1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
32	0	0	1	0	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
48	0	0	1	1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
64	0	1	0	0	5 5 4 4 4 4 4 4 4 4 4 4 4 4 5 4
80	0	1	0	1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
96	0	1	1	0	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
112	0	1	1	1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
128	1	0	0	0	1 1 1 1 1 1 1 1 3 3 3 3 1 1 1 1
144	1	0	0	1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
160	1	0	1	0	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
176	1	0	1	1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 9
192	1	1	0	0	5 5 4 4 4 4 4 4 4 4 4 4 4 4 5 4
208	1	1	0	1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
224	1	1	1	0	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
240	1	1	1	1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

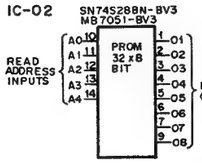
IC-H6 SN74S287N-BV2 MB7052-BV2



READ ADDRESS INPUTS	ADDRESS (when converted into decimal number) 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A0	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
A1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
A2	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
A3	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

ADDRESS (when converted into decimal number)	A7	A6	A5	A4	MEMORIZED DATA SHOWN IN HEXADECIMAL
0	0	0	0	0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
16	0	0	0	1	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
32	0	0	1	0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
48	0	0	1	1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
64	0	1	0	0	6 D 6 A 6 A 6 D 6 D 6 A 6 A C D
80	0	1	0	1	6 D 6 A 6 A 6 D 6 D 6 A 6 A C D
96	0	1	1	0	6 D 6 A 6 A 6 D B D 6 A 6 A C D
112	0	1	1	1	6 D 6 A 6 A 6 D B D 6 A 6 A C D
128	1	0	0	0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
144	1	0	0	1	8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
160	1	0	1	0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
176	1	0	1	1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
192	1	1	0	0	6 D 6 A 6 A C D 6 D 6 A 6 A 6 D
208	1	1	0	1	8 D 6 A 6 A 6 D 0 0 0 0 0 0 0 0
224	1	1	1	0	B D 6 A 6 A C D 6 D 6 A 6 A 6 D
240	1	1	1	1	6 D 6 A 6 A 6 D 0 0 0 0 0 0 0 0

IC-02 SN74S288N-BV3 MB7051-BV3

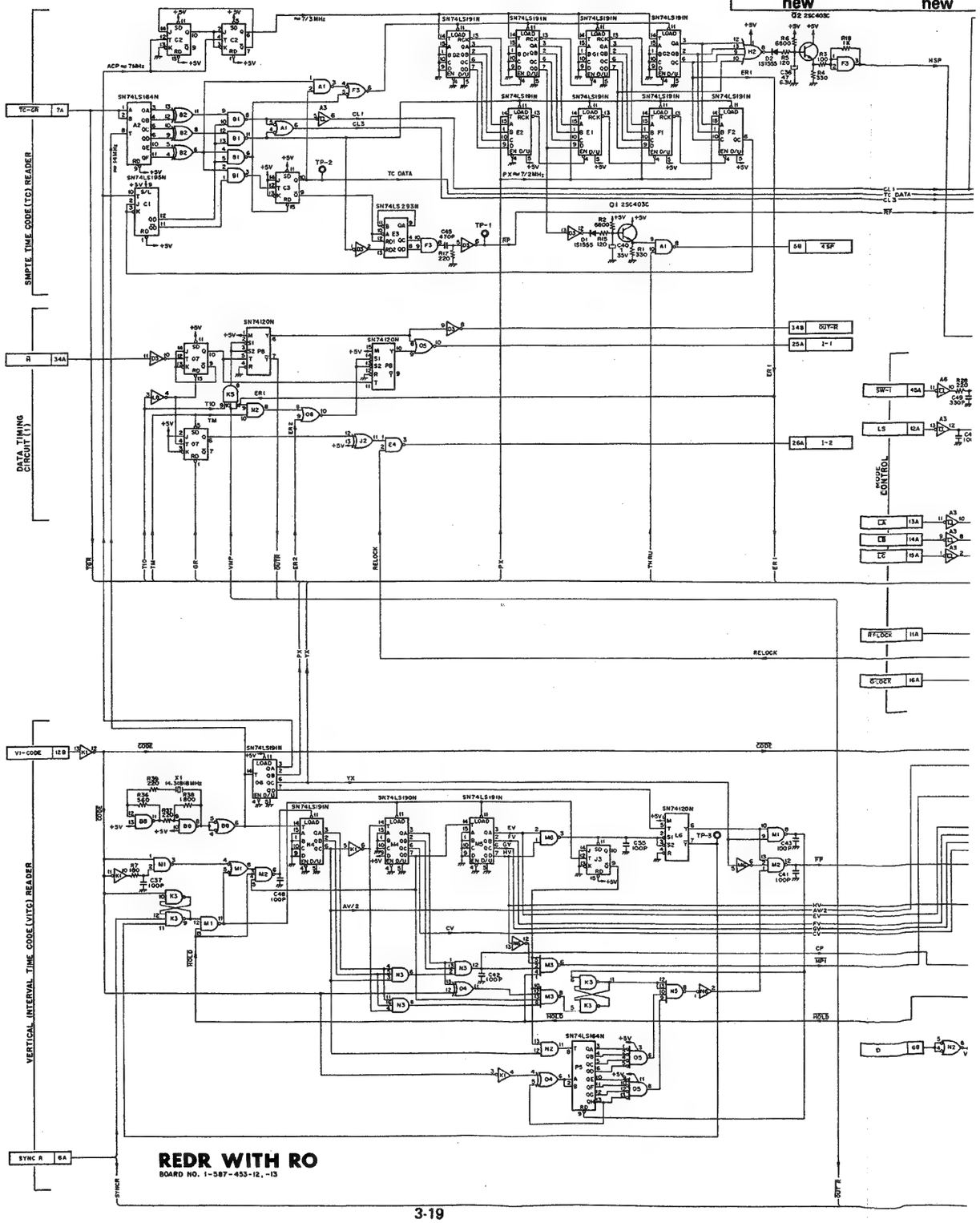


READ ADDRESS INPUTS	ADDRESS (when converted into decimal number) 0	1	2	3	4	5	6	7
A0	0	1	0	1	0	1	0	1
A1	0	0	1	1	0	0	1	1
A2	0	0	0	0	1	1	1	1

ADDRESS (when converted into decimal number)	A4	A3	MEMORIZED DATA SHOWN IN HEXADECIMAL
0	0	0	00 00 00 00 00 00 00 00
8	0	1	00 00 00 00 00 00 00 00
16	1	0	03 F1 E1 82 D1 C1 82 B1
24	1	1	A1 82 91 85 00 00 00 00

IC-A1	SN74LS00N	IC-L6	SN74120N
IC-A2	SN74LS164N	IC-L7	SN74LS109N
IC-A3	SN74LS14N	IC-L8	SN74LS04N
IC-A4	SN74LS259AN	IC-M1	SN74LS00N
IC-A5	SN74LS14N	IC-M2	SN74LS10N
IC-A6	SN74LS14N	IC-M3	SN74LS20N
IC-A7	SN74LS38N	IC-M4	SN74LS190N
IC-B1	SN74LS00N	IC-M5	SN74LS191N
IC-B2	SN74LS86N	IC-M6	SN74LS00N
IC-B3	SN74LS10N	IC-M7	SN74120N
IC-B4	SN74LS151N	IC-M8	SN74LS164N
IC-B5	SN74LS04N	IC-N1	SN74LS221N
IC-B6	SN74LS257N	IC-N2	SN74LS08N
IC-B7	SN74LS189N	IC-N3	SN74LS11N
IC-B8	SN74LS00N	IC-N4	SN74LS191N
IC-C1	SN74LS195N	IC-N5	SN74LS20N
IC-C2	SN74109N	IC-N6	SN74LS04N
IC-C3	SN74LS109N	IC-N7	SN74LS109N
IC-C4	SN74LS191N	IC-N8	SN74LS109N
IC-C5	SN74S287N (BV	IC-O1	SN74LS257N
IC-C6	SN74LS257N	IC-O2	SN74S288N (BV-3)
IC-C7	SN74LS258N	IC-O3	SN74161N
IC-C8	SN74LS164N	IC-O4	SN74LS86N
IC-D1	SN74LS191N	IC-O5	SN7425N
IC-D2	SN74LS191N	IC-O6	SN74LS191N
IC-D3	SN74LS04N	IC-O7	SN74LS109N
IC-D4	SN74LS190N	IC-O8	SN74LS02N
IC-D5	SN74LS151N	IC-P1	SN74S189N
IC-D6	SN74S189N	IC-P2	SN74LS251N
IC-D7	SN74LS258N	IC-P3	SN74160N
IC-D8	SN7425N	IC-P4	SN74160N
IC-E1	SN74LS191N	IC-P5	SN74LS164N
IC-E2	SN74LS191N	IC-P6	SN74LS03N
IC-E3	SN74LS293N	IC-P7	SN74LS12N
IC-E4	SN74LS00N	IC-P8	SN74120N
IC-E5	SN74LS51N	IC-Q1	3258DC
IC-E6	SN74LS85N	IC-Q2	SN74LS107N
IC-E7	SN74LS257N	IC-Q3	SN74LS123N
IC-E8	SN74LS164N	IC-Q4	SN74161N
IC-F1	SN74LS191N	IC-Q5	SN74LS02N
IC-F2	SN74LS191N	IC-Q6	SN74LS20N
IC-F3	SN74LS08N	IC-Q7	SN74161N
IC-F4	SN74LS04N	IC-Q8	SN74LS12N
IC-F5	SN74LS12N	IC191	SN74LS138N
IC-F6	SN74LS86N	IC102	SN74LS11N
IC-F7	SN74LS257N		
IC-F8	SN74LS164N		
IC-G1	SN74LS191N		
IC-G2	SN74LS191N		
IC-G3	SN74S189N		
IC-G4	SN74LS258N		
IC-G5	SN74LS08N		
IC-G6	SN74LS283N		
IC-G7	SN74LS86N		
IC-G8	SN7425N		
IC-H2	SN7425N		
IC-H3	SN74LS194N		
IC-H4	SN74S189N		
IC-H5	SN74LS109N		
IC-H6	SN74S287N (BV-2)		
IC-H7	SN74LS00N		
IC-H8	SN74LS164N		
IC-I1	SN74LS190N		
IC-I2	SN74LS12N		
IC-I3	SN74LS257N		
IC-I4	SN74S189N		
IC-I5	SN74LS257N		
IC-I6	SN74LS27N		
IC-I7	SN74109N		
IC-I8	SN74LS20N		
IC-J1	SN74LS191N		
IC-J2	SN74LS86N		
IC-J3	SN74LS109N		
IC-J4	SN74LS164N		
IC-J5	SN7425N		
IC-J6	SN74161N		
IC-J7	SN74LS10N		
IC-J8	SN74LS04N		
IC-K1	SN74LS04N		
IC-K2	SN74LS20N		
IC-K3	SN74(LS)279N		
IC-K4	SN74LS195N		
IC-K5	SN74LS11N		
IC-K6	SN74LS27N		
IC-K7	SN74LS11N		
IC-K8	SN74LS02N		
IC-L1	SN74LS02N		
IC-L2	SN74LS32N		
IC-L3	SN74LS195N		
IC-L4	SN74LS32N		
IC-L5	SN74LS123N		

REDR
new



REDR new

REDR new

IC-L6 SN74120N
IC-L7 SN74LS109N
IC-L8 SN74LS04N
IC-M1 SN74LS00N
IC-M2 SN74LS10N

IC-M3 SN74LS20N
IC-M4 SN74LS190N
IC-M5 SN74LS191N
IC-M6 SN74LS00N
IC-M7 SN74120N

IC-M8 SN74LS164N
IC-N1 SN74LS221N
IC-N2 SN74LS08N
IC-N3 SN74LS11N
IC-N4 SN74LS191N

IC-N5 SN74LS20N
IC-N6 SN74LS04N
IC-N7 SN74LS109N
IC-N8 SN74LS109N
IC-O1 SN74LS257N

IC-O2 SN74S288N (BV-3)
IC-O3 SN74161N
IC-O4 SN74LS86N
IC-O5 SN7425N
IC-O6 SN74LS191N

IC-O7 SN74LS109N
IC-O8 SN74LS02N
IC-P1 SN74LS189N
IC-P2 SN74LS251N
IC-P3 SN74160N

IC-P4 SN74160N
IC-P5 SN74LS164N
IC-P6 SN74LS03N
IC-P7 SN74LS12N
IC-P8 SN74120N

IC-Q1 3258DC
IC-Q2 SN74LS107N
IC-Q3 SN74LS123N
IC-Q4 SN74161N
IC-Q5 SN74LS02N

IC-Q6 SN74LS20N
IC-Q7 SN74161N
IC-Q8 SN74LS12N

IC191 SN74LS138N
IC102 SN74LS11N

SMPTE TIME CODE(TC) READER

DATA TIMING CIRCUIT (1)

VERTICAL INTERVAL TIME CODE(VITC) READER

REDR WITH RO

BOARD NO. 1-587-453-12, -13

REDR new REDR new

ADDER & SUBTRACTER OF DATA

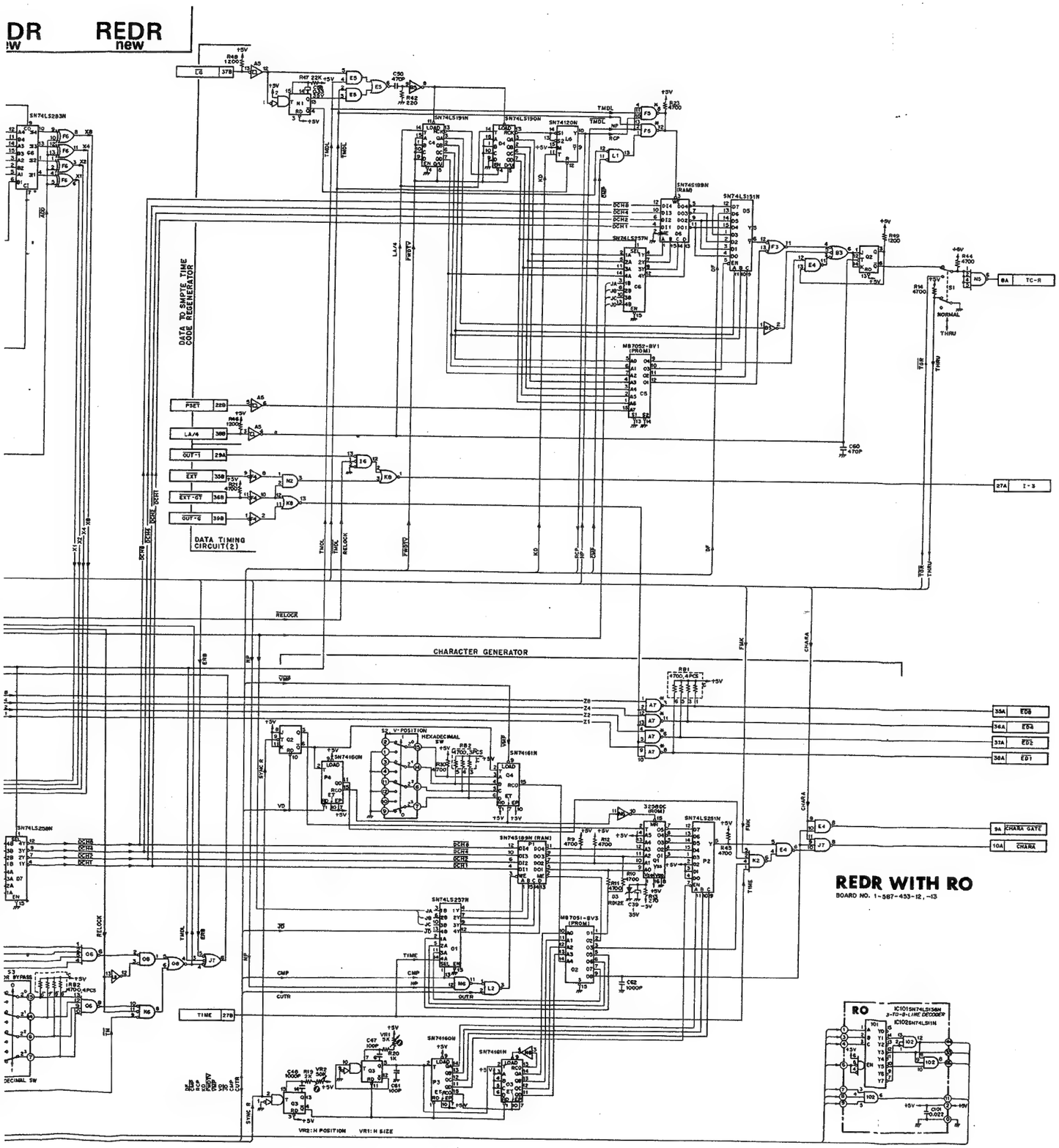
DATA TO SMPTE TIME CODE REGENERATOR

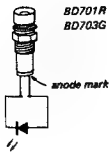
DATA TIMING CIRCUIT(2)

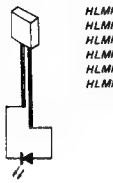
TC/VITC DATA SELECTOR & ERROR BYPASS CIRCUIT

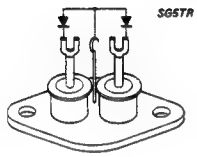
CHARACTER GENERATOR

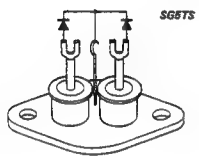
REDR WITH RC
BOARD NO. 1-587-435-12, -13

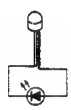

DATA TO SMPTE TIME CODE REGENERATOR
DATA TIMING CIRCUIT(2)
CHARACTER GENERATOR
REDR WITH RO
BOARD NO. 1-587-453-12, -13
RO
PSET 22B
LA/4 30B
OUT-1 29A
EXT 33B
EXT-DT 34B
OUT-2 39B
TIME 27B
27A I-3
8A TC-R
33A ED0
34A ED3
37A ED2
38A ED1
9A CHARA GATE
10A CHARA
THRU
NORMAL
RELOCK
VRS: H POSITION
VR1: H SIZE



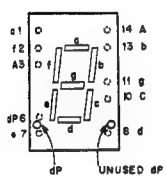


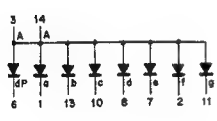


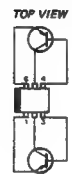


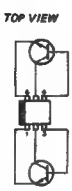


5082-7650 (HP)
7-SEGMENT LED
— TOP VIEW —

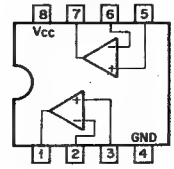




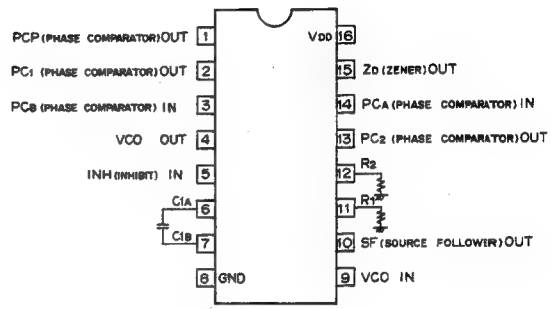


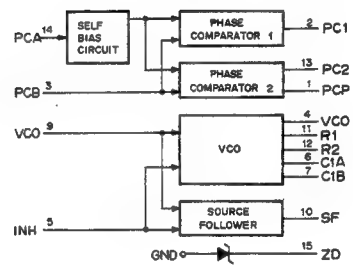


HA17458GS (HITACHI)
LM1458N (NSC)
OPERATIONAL AMPLIFIER
— TOP VIEW —

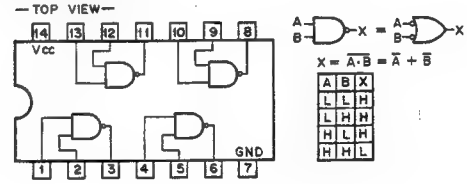


MC14046BCP (MOTOROLA)
C-MOS PHASE LOCKED LOOP
— TOP VIEW —



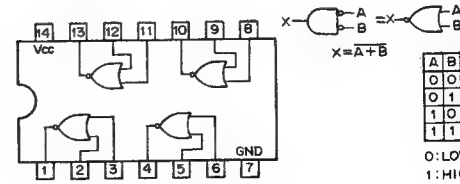


SN7400N (TI) M53200P (MITSUBISHI)
SN74S00N (TI)
SN74LS00N (TI)
TTL NAND GATE
— TOP VIEW —



A	B	X
L	L	H
L	H	H
H	L	H
H	H	L

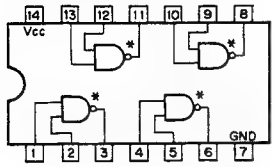
SN7402N (TI) M53202P (MITSUBISHI)
SN74S02N (TI)
SN74LS02N (TI)
TTL 2-INPUT POSITIVE-NOR GATE
— TOP VIEW —

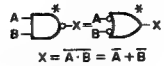


A	B	X
0	0	1
0	1	0
1	0	0
1	1	0

0 : LOW LEVEL
1 : HIGH LEVEL

SN7403N (TI), SN74L03N (TI)
SN74LS03N (TI), SN74S03N (TI)
TLL 2-INPUT POSITIVE-NAND GATE
WITH OPEN-COLLECTOR
— TOP VIEW —

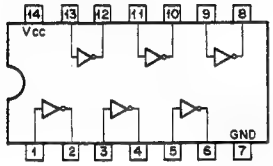


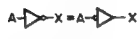


A	B	X
L	L	H
L	H	H
H	L	H
H	H	L

SN7404N (TI) M53204P (MITSUBISHI)
SN74L04N (TI)
SN74S04N (TI)
SN74LS04N (TI)

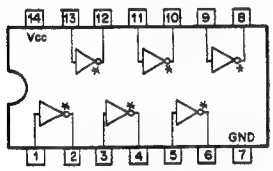
TTL INVERTER
—TOP VIEW—





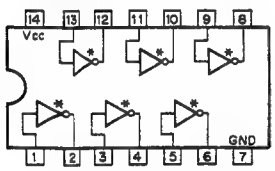
A	X
L	H
H	L

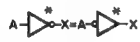
SN74LS05N (TI) SN7405N (TI)
74LS05PC (FSC)
TTL INVERTER WITH OPEN COLLECTOR
- TOP VIEW -



*: OPEN COLLECTOR MARK

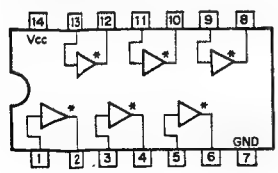
SN7406N (TI) M53206P (MITSUBISHI)
TTL INVERTER BUFFER/DRIVER
WITH OPEN-COLLECTOR
— TOP VIEW —





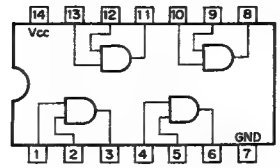
A	X
L	H
H	L

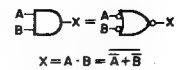
SN7407N (TI)
TTL BUFFER / DRIVER
WITH OPEN - COLLECTOR
— TOP VIEW —



A	X
L	L
H	H

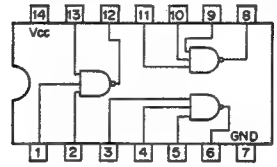
SN7408N (TI), SN74S08N (TI)
SN74LS08N (TI)
TTL 2-INPUT POSITIVE-AND GATE
— TOP VIEW —

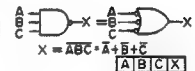




A	B	X
L	L	L
L	H	L
H	L	L
H	H	H

SN7410N (TI)
SN74L10N (TI)
SN74S10N (TI)
SN74LS10N (TI)
TTL 3-INPUT POSITIVE NAND GATE
—TOP VIEW—

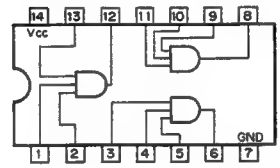


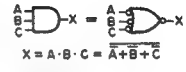


A	B	C	X
0	0	0	1
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	0

0: LOW LEVEL
1: HIGH LEVEL

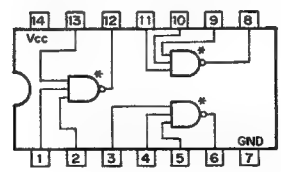
SN74H11N (TI), SN74S11N (TI)
SN74LS11N (TI)
TTL 3-INPUT POSITIVE-AND GATE
— TOP VIEW —

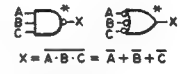




A	B	C	X
L	L	L	L
L	L	H	L
L	H	L	L
L	H	H	L
H	L	L	L
H	L	H	L
H	H	L	L
H	H	H	H

SN74LS12N (TI), SN7412N (TI)
TTL 3-INPUT POSITIVE-NAND GATE
WITH OPEN-COLLECTOR
— TOP VIEW —

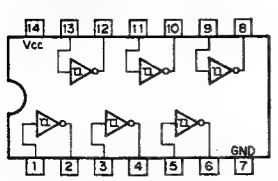


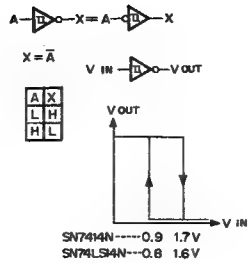


A	B	C	X
L	L	L	H
L	L	H	H
L	H	L	H
L	H	H	H
H	L	L	H
H	L	H	H
H	H	L	H
H	H	H	L

BVG-1000

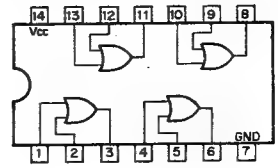
SN74LS14N (TI), SN7414N (TI)
TTL INVERTER SCHMITT TRIGGER
— TOP VIEW —

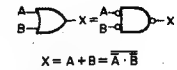




A	X
L	H
H	L

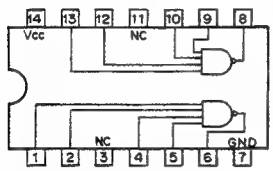
SN7432N (TI), SN74S32N (TI)
SN74LS32N (TI)
TTL 2-INPUT POSITIVE-OR GATE
— TOP VIEW —

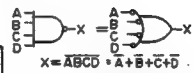




A	B	X
L	L	L
L	H	H
H	L	H
H	H	H

SN74LS20N (TI) SN7420N (TI)
TTL 4-INPUT POSITIVE NAND GATE
—TOP VIEW—

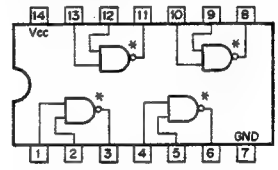


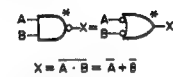


A	B	C	D	X
0	0	0	0	1
0	0	0	1	1
0	0	1	0	1
0	0	1	1	1
0	1	0	0	1
:	:	:	:	:
1	1	0	1	1
1	1	1	0	1
1	1	1	1	0

0; LOW LEVEL
1; HIGH LEVEL

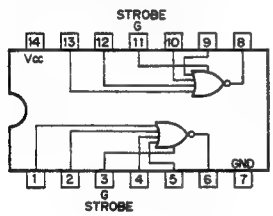
SN7438N (TI), SN74S38N (TI)
SN74LS38N (TI)
TTL 2-INPUT POSITIVE-NAND GATE BUFFER
WITH OPEN-COLLECTOR
— TOP VIEW —

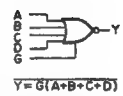




A	B	X
L	L	H
L	H	H
H	L	H
H	H	L

SN7425N (TI)
TTL POSITIVE-NOR GATE WITH STROBE
— TOP VIEW —

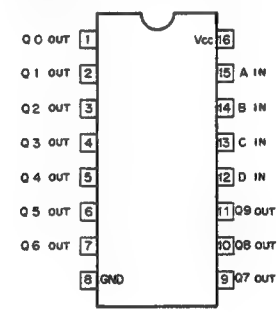


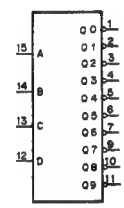


G	A	B	C	D	Y
X	L	L	L	L	H
H	L	L	L	H	L
H	L	L	H	L	L
H	L	L	H	H	L
:	:	:	:	:	L
H	H	H	H	L	L
H	H	H	H	H	L
L	X	X	X	X	H

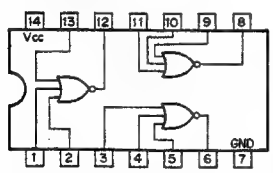
X: DON'T CARE

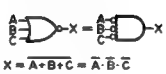
SN74L42N (TI)
SN74LS42N (TI), SN7442AN (TI)
TTL BCD TO DECIMAL DECODER
— TOP VIEW —





SN74LS27N (TI), SN7427N (TI)
TTL 3-INPUT POSITIVE-NOR GATE
— TOP VIEW —





A	B	C	X
L	L	L	H
L	L	H	L
L	H	L	L
L	H	H	L
H	L	L	L
H	L	H	L
H	H	L	L
H	H	H	L

COUNT	INPUTS				OUTPUTS									
	D	C	B	A	O9	O8	O7	O6	O5	O4	O3	O2	O1	O0
0	0	0	0	0	1	1	1	1	1	1	1	1	1	0
1	0	0	0	1	1	1	1	1	1	1	1	1	0	1
2	0	0	1	0	1	1	1	1	1	1	1	0	1	1
3	0	0	1	1	1	1	1	1	1	1	0	1	1	1
4	0	1	0	0	1	1	1	1	1	0	1	1	1	1
5	0	1	0	1	1	1	1	1	0	1	1	1	1	1
6	0	1	1	0	1	1	1	0	1	1	1	1	1	1
7	0	1	1	1	1	1	0	1	1	1	1	1	1	1
8	1	0	0	0	1	0	1	1	1	1	1	1	1	1
9	1	0	0	1	0	1	1	1	1	1	1	1	1	1
INVALID	1	0	1	0	1	1	1	1	1	1	1	1	1	1
	1	0	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	0	0	1	1	1	1	1	1	1	1	1	1
	1	1	0	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	0	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1	1	1

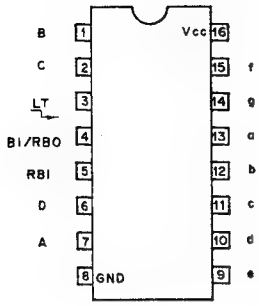
0; LOW
1; HIGH

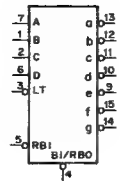
BVG-1000

SN7447AN (TI)
SN74L47N (TI)
SN74LS47N(TI)

TTL BCD-TO-SEVEN-SEGMENT DECODER/DRIVER
WITH OPEN COLLECTOR OUTPUT

—TOP VIEW—





LT: LAMP TEST
BI/RBO: BLANKING IN/RIPPLE BLANKING OUT
RBI: RIPPLE BLANKING IN

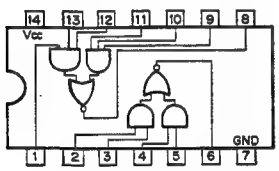
INPUT						BI/RBO	OUTPUT							DISPLAY (HEXADECIMAL)	DECIMAL
LT	RBI	D	C	B	A		a	b	c	d	e	f	g		
1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0
1	X	0	0	0	1	1	1	0	0	1	1	1	1	1	1
1	X	0	0	1	0	1	0	0	1	0	0	1	0	2	2
1	X	0	0	1	1	1	0	0	0	0	1	1	0	3	3
1	X	0	1	0	0	1	1	0	0	1	1	0	0	4	4
1	X	0	1	0	1	1	0	1	0	0	1	0	0	5	5
1	X	0	1	1	0	1	1	1	0	0	0	0	0	6	6
1	X	0	1	1	1	1	0	0	0	1	1	1	1	7	7
1	X	1	0	0	0	1	0	0	0	0	0	0	0	8	8
1	X	1	0	0	1	1	0	0	0	1	1	0	0	9	9
1	X	1	0	1	0	1	1	1	1	0	0	1	0	c	10
1	X	1	0	1	1	1	1	1	0	0	1	1	0	J	11
1	X	1	1	0	0	1	1	0	1	1	1	0	0	U	12
1	X	1	1	0	1	1	0	1	1	0	1	0	0	E	13
1	X	1	1	1	0	1	1	1	1	0	0	0	0	E	14
1	X	1	1	1	1	1	1	1	1	1	1	1	1	BLANK	15
X	X	X	X	X	X	0	1	1	1	1	1	1	1	BLANK	15
1	0	0	0	0	0	0*	1	1	1	1	1	1	1	BLANK	15
0	X	X	X	X	X	1	0	0	0	0	0	0	0	8	8
1	1	0	0	0	0	1	1	1	1	1	1	1	1	BLANK	15

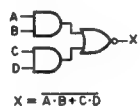
* When RBI and inputs A, B, C, and D are at a low "0" level with the LT input high "H", all segment outputs go off ("1") and the RBO goes to a low "0" level (response condition).

SN74LS51N(TI), SN74L51N(TI)

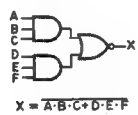
TTL 2-WIDE 2-INPUT / 3-INPUT AND-OR-INVERT GATE

—TOP VIEW—





$X = \overline{A \cdot B + C \cdot D}$

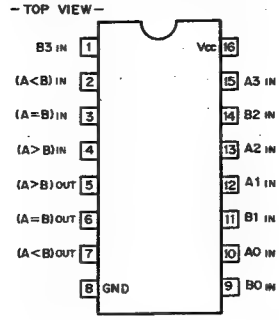


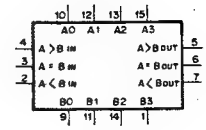
$X = \overline{A \cdot B \cdot C + D \cdot E \cdot F}$

SN7485N (TI)
SN74S85N (TI)
SN74LS85N (TI)

TTL 4-BIT MAGNITUDE COMPARATOR

—TOP VIEW—



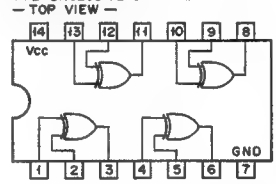


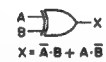
INPUTS									OUTPUTS		
DATA COMPARING					CASCADING						
	A3, B3	A2, B2	A1, B1	A0, B0	A<B	A=B	A>B	A<B	A=B	A>B
A>B	A3>B3	X	X	X	X	X	X	0	0	1
	A3=B3	A2>B2	X	X						
	A3=B3	A2=B2	A1>B1	X						
	A3=B3	A2=B2	A1=B1	A0>B0						
A=B	A3=B3	A2=B2	A1=B1	A0=B0	0	0	0	1	0	1
					0	0	1	0	0	1
					X	1	X	0	1	0
					1	0	0	1	0	0
					1	0	1	0	0	0
A<B	A3=B3	A2=B2	A1=B1	A0<B0	X	X	X	1	0	0
	A3=B3	A2=B2	A1<B1	X						
	A3=B3	A2<B2	X	X						
	A3<B3	X	X	X						

SN74LS86N (TI) SN7486N (TI)
SN74S86N (TI)

TTL EXCLUSIVE OR GATE

— TOP VIEW —





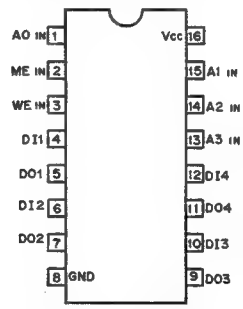
$X = \overline{A} \cdot B + A \cdot \overline{B}$

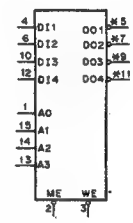
A	B	X
L	L	L
L	H	H
H	L	H
H	H	L

SN7489N (TI)

TTL 64-BIT (16-WORD BY 4-BIT) RAM
WITH OPEN-COLLECTOR OUTPUT

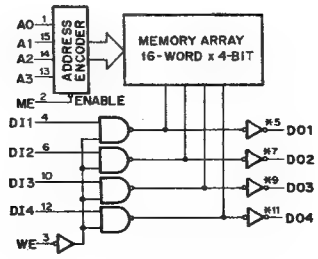
—TOP VIEW—





A0, A1, A2, A3 ; ADDRESS INPUTS
DI ; DATA INPUTS
DO ; DATA OUTPUTS
ME ; MEMORY ENABLE INPUT
WE ; WRITE ENABLE INPUT

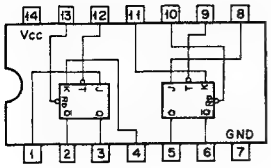
ME	WE	FUNCTION	OUTPUTS
L	L	WRITE	$\overline{DI}$
L	H	READ	COMPLEMENT OF DATA ENTERED
H	L	INHIBIT STORAGE	$\overline{DI}$
H	H	DO NOTHING	OFF



SN74LS107N (TI)

TTL J-K FLIP FLOP WITH DIRECT RESET

—TOP VIEW—

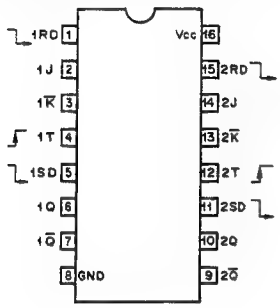


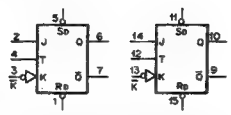
INPUTS				OUT
Rd	T	J	K	Qn+1
L	X	X	X	L
H	↓	L	L	Qn
H	↓	L	H	L
H	↓	H	L	H
H	↓	H	H	$\overline{Qn}$
H	H	X	X	Qn

SN74109N (TI)
SN74LS109AN (TI)

TTL J-$\overline{K}$ FLIP-FLOP WITH DIRECT SET/RESET

— TOP VIEW —





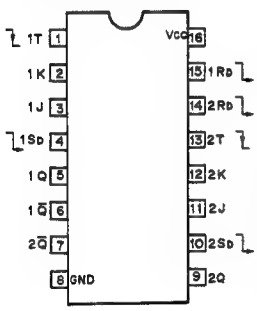
INPUTS					OUTPUTS	
$\overline{Sd}$	$\overline{Rd}$	T	J	$\overline{K}$	Qn+1	$\overline{Qn+1}$
L	H	X	X	X	H	L
H	L	X	X	X	L	H
L	L	X	X	X	H*	H*
H	H	↓	L	H	Qn	$\overline{Qn}$
			L	L	L	H
			H	H	H	L
			H	L	$\overline{Qn}$	Qn
H	H	L	X	X	Qn	$\overline{Qn}$

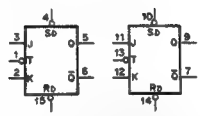
*; NONSTABLE

SN74S112N (TI)
SN74LS112AN (TI)

TTL J-K FLIP-FLOP WITH DIRECT SET/RESET

—TOP VIEW—





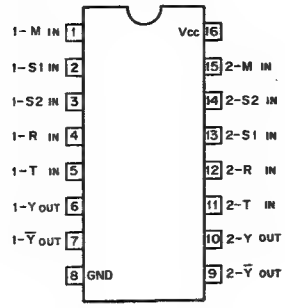
INPUTS					OUTPUTS	
SD	RD	T	J	K	Qn+1	$\overline{Qn+1}$
L	H	X	X	X	H	L
H	L	X	X	X	L	H
L	L	X	X	X	H*	H*
H	H	↓	L	L	Qn	$\overline{Qn}$
			L	H	L	H
			H	L	H	L
			H	H	$\overline{Qn}$	Qn
H	H	H	X	X	Qn	$\overline{Qn}$

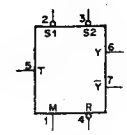
*; NONSTABLE

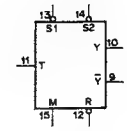
SN74120N (TI)

TTL PULSE SYNCHRONIZER/ DRIVER

—TOP VIEW—







INPUT M	OUTPUT MODE
0	TRAIN OF PULSES
1	SINGLE PULSE

INPUTS			FUNCTION
R	S1	S2	
X	0	X	PASS OUTPUT PULSES
X	X	0	PASS OUTPUT PULSES
0	1	1	INHIBIT OUTPUT PULSES
1	↓	1	START OUTPUT PULSES
1	1	↓	START OUTPUT PULSES
↓	1	1	STOP OUTPUT PULSES
1	1	1	CONTINUE

S1, S2 ; START COMMAND INPUTS

R ; STOP COMMAND INPUT

M ; MODE CONTROL INPUT

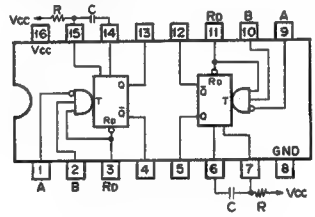
T ; PULSE INPUT

Y, $\overline{Y}$; SYNCHRONIZED PULSE OUTPUT

SN74123N (TI)
SN74L123N (TI)
SN74LS123N (TI)

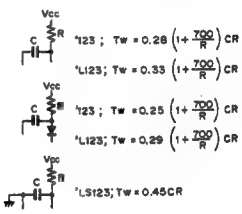
TTL RETRIGGERABLE MONOSTABLE MULTIVIBRATOR WITH DIRECT RESET

—TOP VIEW—



INPUTS			OUTPUTS	
Rd	A	B	Q	$\overline{Q}$
L	X	X	L	H
X	H	X	L	H
X	X	L	L	H
H	L	↑	⎍	⎍
H	↓	H	⎍	⎍
↑	L	H	⎍	⎍

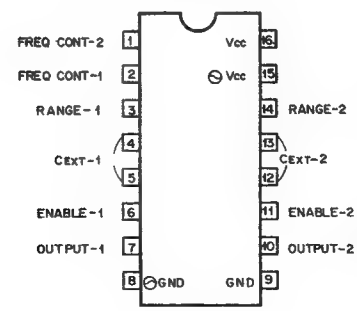
OUTPUT PULSE WIDTH

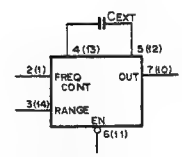


SN74LS124N (TI)
SN74S124N (TI)

TTL VOLTAGE-CONTROLLED OSCILLATOR

—TOP VIEW—





LS124: 0.12Hz ~ 30MHz

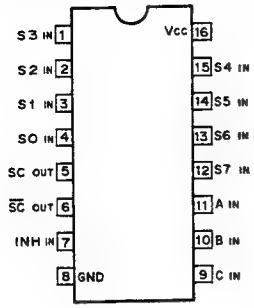
$f_o = \frac{1 \times 10^{-6}}{C_{EXT}}$ (Hz)

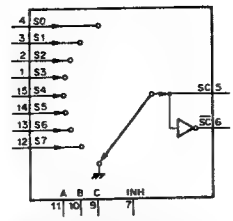
S124: 0.12Hz ~ 85MHz

$f_o = \frac{5 \times 10^{-4}}{C_{EXT}}$ (Hz)

BVG-1000

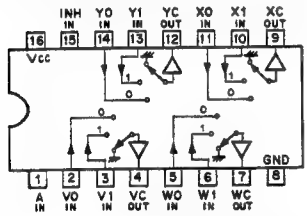
SN74151AN (TI)
SN74S151N (TI)
SN74LS151N (TI)
TTL 8-LINE-TO-1-LINE DATA SELECTOR/MULTIPLEXER
– TOP VIEW –

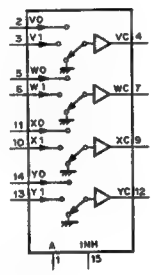




CONTROL INPUTS				ON CHANNEL
INH	C	B	A	
L	L	L	L	0
L	L	L	H	1
L	L	H	L	2
L	L	H	H	3
L	H	L	L	4
L	H	L	H	5
L	H	H	L	6
L	H	H	H	7
H	X	X	X	GND

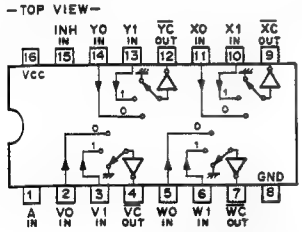
SN74157N (TI)
SN74L157N (TI)
SN74S157N (TI)
SN74LS157N (TI)
TTL 2-LINE-TO-1-LINE DATA SELECTOR/MULTIPLEXER
– TOP VIEW –

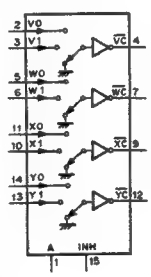




CONT. IN		ON CHANNEL
INH	A	
L	L	0
L	H	1
H	X	GND

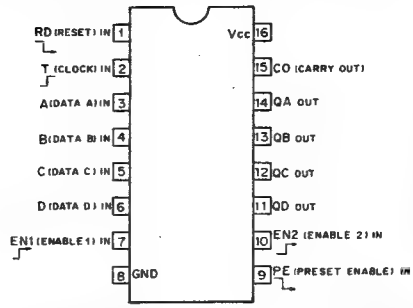
SN74S158N (TI)
SN74LS158N (TI)
TTL 2-LINE-TO-1-LINE INVERTED DATA SELECTOR/MULTIPLEXER
– TOP VIEW –

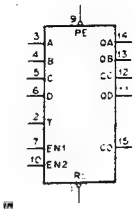




CONT. IN		ON CHANNEL
INH	A	
L	L	0
L	H	1
H	X	GND

SN74160N (TI)
SN74LS160AN (TI)
TTL PRESETTABLE SYNCHRONOUS 4-BIT DECADE COUNTER
– TOP VIEW –





MODE SELECTION

CONTROL INPUTS				MODE
RD	PE	EN1	EN2	
0	X	X	X	RESET (ASYNCHRONOUS)
1	0	X	X	PRESET (SYNCHRONOUS)
1	1	0	X	NO COUNT
1	1	X	0	NO COUNT
1	1	1	1	COUNT

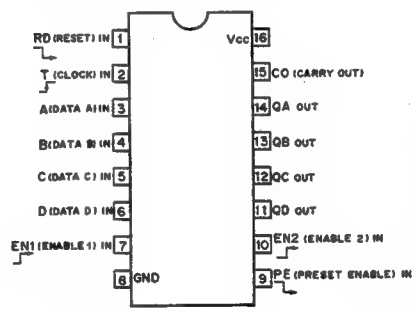
COUNT SEQUENCE

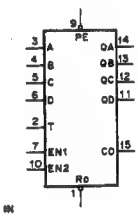
COUNT	OUTPUTS				
	QD	QC	QB	QA	CO
0	0	0	0	0	0
1	0	0	0	1	0
2	0	0	1	0	0
3	0	0	1	1	0
4	0	1	0	0	0
5	0	1	0	1	0
6	0	1	1	0	0
7	0	1	1	1	0
8	1	0	0	0	0
9	1	0	0	1	1

CARRY OUTPUT "CO"

CO IS HIGH WHEN EN2 INPUT IS HIGH AND COUNT IS "9".

SN74161N (TI)
SN74LS161AN (TI)
TTL PRESETTABLE SYNCHRONOUS 4-BIT BINARY COUNTER
– TOP VIEW –





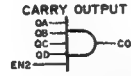
MODE SELECTION

CONTROL INPUTS				MODE
R0	PE	EN1	EN2	
0	X	X	X	RESET (ASYNCHRONOUS)
1	0	X	X	PRESET (SYNCHRONOUS)
1	1	0	X	NO COUNT
1	1	X	0	NO COUNT
1	1	1	1	COUNT

COUNT SEQUENCE

COUNT	OUTPUTS			
	QD	QC	QB	QA
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1
12	1	1	0	0
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

CARRY OUTPUT "CO"



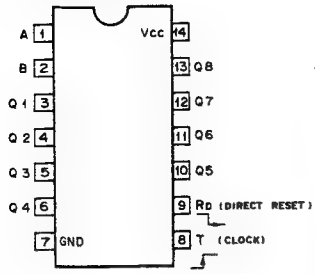
CO IS HIGH WHEN EN2 INPUT IS HIGH AND COUNT IS "15".

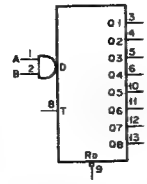
BVG-1000

SN74164N (TI)
SN74L164N (TI)
SN74LS164N (TI)

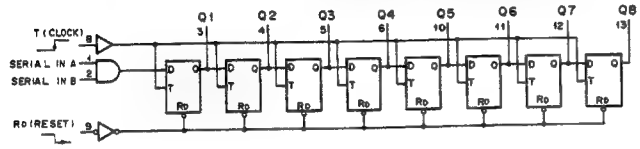
TTL 8-BIT PARALLEL-OUT SERIAL SHIFT REGISTER

—TOP VIEW—





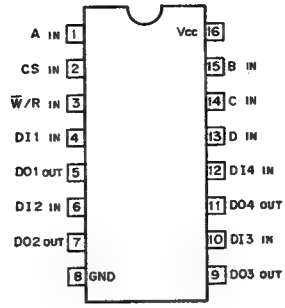
INPUTS				OUTPUTS			
RD	T	A	B	Q1	Q2	----	Q8
L	X	X	X	L	L	L	L
H	L	X	X	Q1o	Q2o	----	Q8o
H	↑	H	H	H	Q1n	----	Q7n
H	↑	L	X	L	Q1n	----	Q7n
H	↑	X	L	L	Q1n	----	Q7n

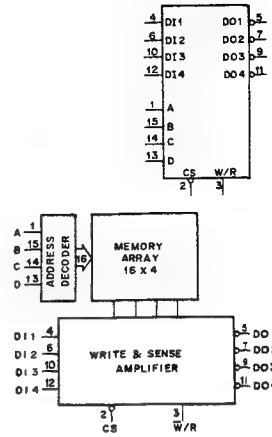


SN74S189N (TI)

BIPOLAR 64-BIT RAM WITH THREE-STATE OUTPUT

— TOP VIEW —





DI1 ~ DI4 ; DATA INPUTS

DO1 ~ DO4 ; DATA OUTPUTS

A, B, C, D ; ADDRESS INPUTS

CS ; CHIP SELECT INPUT

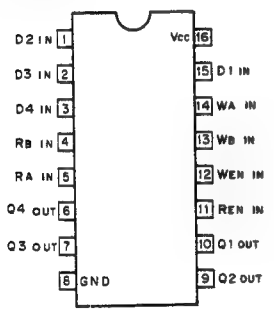
$\overline{W}/R$; WRITE/READ ENABLE IN

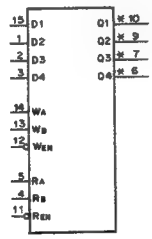
CS	$\overline{W}/R$	FUNCTION	OUTPUTS
0	0	WRITE	HIGH IMPEDANCE
0	1	READ	COMPLEMENT OF DATA ENTERED
1	X	INHIBIT	HIGH IMPEDANCE

SN74170N (TI)
SN74LS170N (TI)

TTL 4-BY-4 REGISTER FILES WITH OPEN-COLLECTOR OUTPUTS

—TOP VIEW—





D1, D2, D3, D4; DATA INPUTS

Q1, Q2, Q3, Q4; DATA OUTPUTS

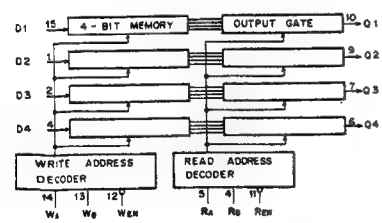
WA, WB; WRITE ADDRESS INPUTS

RA, RB; READ ADDRESS INPUTS

WEN; WRITE ENABLE INPUT

RE ; READ ENABLE INPUT

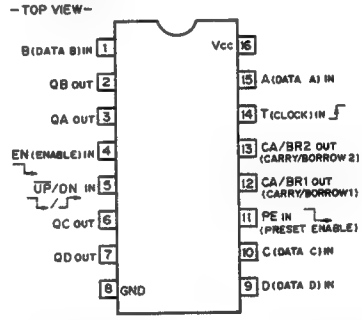
ENABLE IN		FUNCTION	
WEN	REN	WRITE	READ
0	0	ENABLE	ENABLE
0	1	ENABLE	INHIBIT (OUTPUTS: HIGH)
1	0	INHIBIT	ENABLE
1	1	INHIBIT	INHIBIT (OUTPUTS: HIGH)

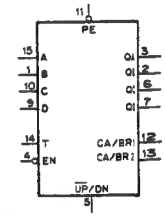


SN74190N (TI)
SN74LS190N (TI)

TTL PRESETTABLE SYNCHRONOUS BCD UP/DOWN COUNTER

-TOP VIEW-





MODE SELECTION

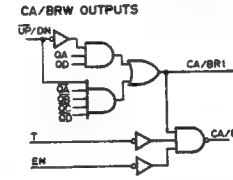
CONTROL INPUTS			MODE
PE	EN	$\overline{UP}/DN$	
0	X	X	PRESET (ASYNCRONOUS)
1	1	X	NO COUNT
1	0	0	UP COUNT
1	0	1	DOWN COUNT

COUNT SEQUENCE

COUNT	OUTPUTS			
	QD	QC	QB	QA
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1

UP COUNT / DOWN COUNT

CA/BRW OUTPUTS



CA/BR1 OUTPUT IS HIGH WHEN COUNT IS "9" AT UP-COUNT OR WHEN COUNT IS "0" AT DOWN COUNT.

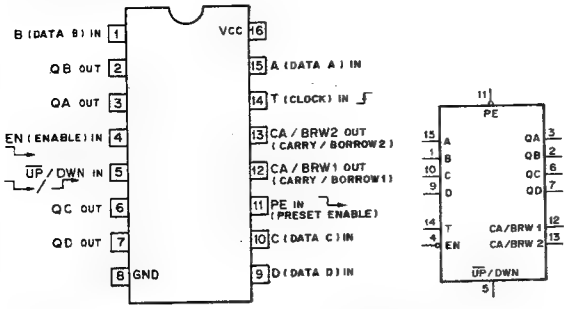
CA/BR2 OUTPUT IS LOW WHEN CLOCK INPUT IS LOW AND EN INPUT IS LOW AND CA/BR1 OUTPUT IS HIGH.

BVG-100

SN74191N (TI)
SN74LS191N (TI)

TTL PRESETTABLE SYNCHRONOUS 4-BIT BINARY UP/DOWN COUNTER

— TOP VIEW —



MODE SELECTION

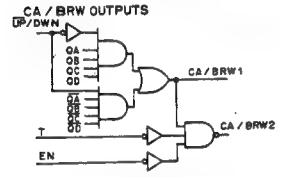
CONTROL INPUTS			MODE
PE	EN	UP/DWN	
0	X	X	PRESET (ASYNCHRONOUS)
1	1	X	NO COUNT
1	0	0	UP COUNT
1	0	1	DOWN COUNT

COUNT SEQUENCE

COUNT	OUTPUTS			
	QD	QC	QB	QA
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1
12	1	1	0	0
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

UP COUNT — DOWN COUNT

CA/BRW OUTPUTS



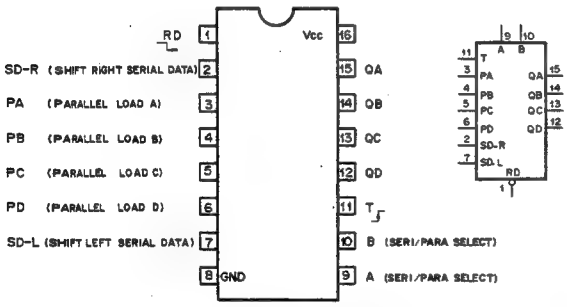
CA/BRW1 OUTPUT IS HIGH WHEN COUNT IS "15" AT UP-COUNT OR WHEN COUNT IS "0" AT DOWN COUNT.

CA/BRW2 OUTPUT IS LOW WHEN CLOCK INPUT IS LOW AND EN INPUT IS LOW AND CA/BRW1 OUTPUT IS HIGH.

SN74LS194AN (TI)
SN74S194N (TI)

TTL 4-BIT BIDIRECTIONAL UNIVERSAL SHIFT REGISTER

—TOP VIEW—



INPUTS										OUTPUTS			
RD	MODE B	MODE A	T	SERIAL SD-L	SERIAL SD-R	PARALLEL LOAD PA	PB	PC	PD	QA	QB	QC	QD
0	X	X	X	X	X	X	X	X	X	0	0	0	0
1	X	X	0	X	X	X	X	X	X	QAo	QBo	QCo	QDo
1	1	1	↑	X	X	A	B	C	D	A	B	C	D
1	0	1	↑	X	1	X	X	X	X	1	QAn	QBn	QCn
1	0	1	↑	X	0	X	X	X	X	0	QAn	QBn	QCn
1	1	0	↑	1	X	X	X	X	X	QBn	QCn	QDn	1
1	1	0	↑	0	X	X	X	X	X	QBn	QCn	QDn	0
1	0	0	X	X	X	X	X	X	X	QAo	QBo	QCo	QDo

LOAD

QA—QD

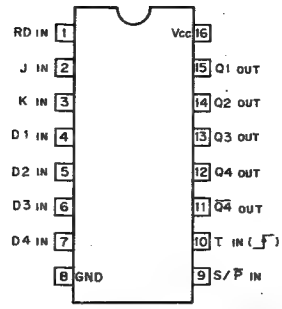
QA—QD

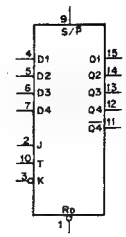
A, B, C, D = THE LEVEL OF STEADY-STATE INPUT AT PA, PB, PC, OR PD, RESPECTIVELY.
QAo, QBo, QCo, QDo = THE LEVEL OF QA, QB, QC OR QD RESPECTIVELY, BEFORE THE INDICATED STEADY-STATE INPUT CONDITIONS WERE ESTABLISHED
QAn, QBn, QCn, QDn = THE LEVEL OF QA, QB, QC OR QD RESPECTIVELY, BEFORE MOST RECENT ↑ TRANSITION OF THE CLOCK.

SN74S195N (TI)
SN74LS195AN (TI)

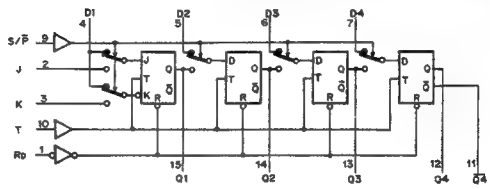
TTL 4-BIT PARALLEL-ACCESS SHIFT REGISTER

—TOP VIEW—





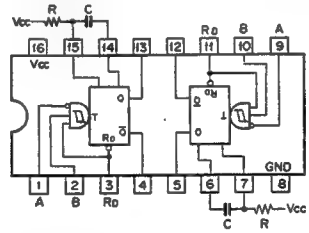
INPUTS									OUTPUTS				
RD	S/P	T	J	K	D1	D2	D3	D4	Q1	Q2	Q3	Q4	Q4
0	X	X	X	X	X	X	X	X	0	0	0	0	1
1	0	↑	X	X	d1	d2	d3	d4	d1	d2	d3	d4	d4
1	1	0	X	X	X	X	X	X	Q1o	Q2o	Q3o	Q4o	Q4o
1	1	↑	0	1	X	X	X	X	Q1o	Q1o	Q2n	Q3n	Q3n
1	1	↓	0	0	X	X	X	X	0	Q1n	Q2n	Q3n	Q3n
1	1	↑	1	1	X	X	X	X	1	Q1n	Q2n	Q3n	Q3n
1	1	↑	1	0	X	X	X	X	Q1o	Q1n	Q2n	Q3n	Q3n



SN74221N (TI)
SN74LS221N (TI)

TTL MONOSTABLE MULTIVIBRATOR WITH SCHMITT TRIGGER INPUT

— TOP VIEW —



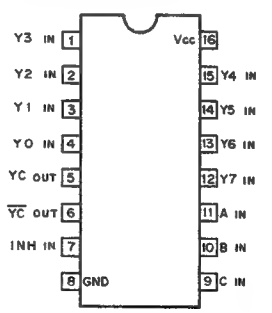
INPUTS			OUTPUTS	
Rp	A	B	Q	Q̄
L	X	X	L	H
X	H	X	L	H
X	X	L	L	H
H	L	↑	⊓	⊔
H	↓	H	⊓	⊔
↑	L	H	⊓	⊔

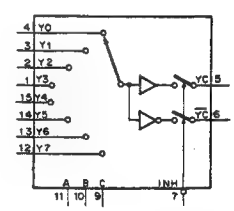
OUTPUT PULSE WIDTH = 0.7CR

SN74251N (TI)
SN74S251N (TI)
SN74LS251N (TI)

TTL 8-LINE-TO-1-LINE DATA SELECTOR/MULTIPLEXER WITH THREE-STATE OUTPUT

— TOP VIEW —





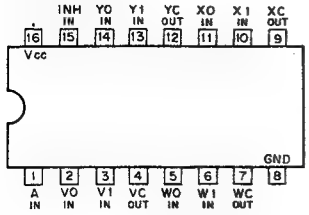
CONTROL IN				OUTPUTS	
C	B	A	INH	YC	YC
X	X	X	1	Z	Z
0	0	0	0	Y0	Y0
0	0	1	1	Y1	Y1
0	1	0	1	Y2	Y2
0	1	1	1	Y3	Y3
1	0	0	1	Y4	Y4
1	0	1	1	Y5	Y5
1	1	0	1	Y6	Y6
1	1	1	1	Y7	Y7

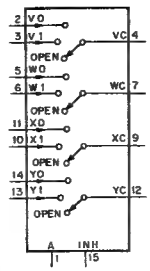
Z: HIGH IMPEDANCE

SN74LS257N (TI)

TTL 2-LINE-TO-1-LINE DATA SELECTOR/MULTIPLEXER

— TOP VIEW—



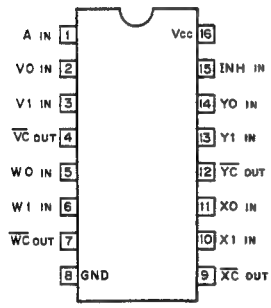


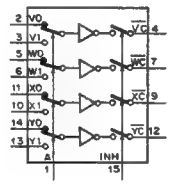
CONT. IN		ON CHANNEL
INH	A	
L	L	0
L	H	1
H	X	OPEN

SN74S258N (TI)
SN74LS258AN (TI)

TTL 2-LINE-TO-1-LINE DATA SELECTOR/MULTIPLEXER WITH THREE-STATE OUTPUT

— TOP VIEW —



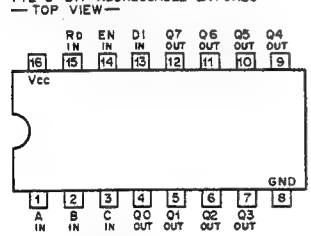


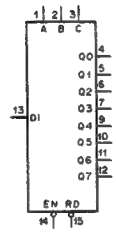
INPUTS				OUTPUT
A	INH	CH-0	CH-1	
X	1	X	X	HI-IMPEDANCE
0	0	0	X	1
0	0	1	X	0
1	0	X	0	1
1	0	X	1	0

SN74259N (TI)
SN74LS259N (TI)

TTL 8-BIT ADDRESSABLE LATCHES

—TOP VIEW—





MODE SELECTION

CONTROL INPUTS		OUTPUT OF ADDRESSED LATCH	OUTPUT OF EACH OTHER LATCH
RD	EN		
1	0	D1	Qno
1	1	Qno	Qno
0	0	D1	0
0	1	0	0

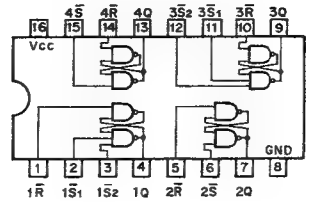
LATCH SELECTION

CONTROL INPUTS			ADDRESSED LATCH
C	B	A	
0	0	0	0
0	0	1	1
0	1	0	2
0	1	1	3
1	0	0	4
1	0	1	5
1	1	0	6
1	1	1	7

SN74279N (TI)
SN74LS279N (TI)

TTL R-S LATCH

—TOP VIEW—



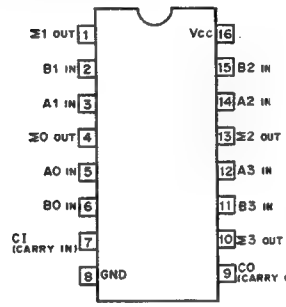
S̄	R̄	Q
L	L	H
L	H	H
H	L	L
H	H	Q0

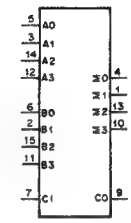
S̄; H=BOTH S̄ INPUTS HIGH
L=ONE OR BOTH S̄ INPUTS LOW

SN74283N (TI)
SN74S283N (TI)
SN74LS283N (TI)

TTL 4-BIT BINARY FULL ADDER

—TOP VIEW—



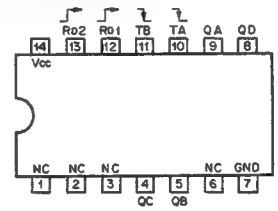


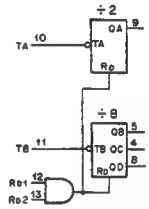
2^4	2^3	2^2	2^1	2^0	DIGIT
				CI	CARRY IN
	A3	A2	A1	A0	DATA A IN
+	B3	B2	B1	B0	DATA B IN
CO	Σ3	Σ2	Σ1	Σ0	CARRY&SUM OUT
EX.				1	CI
	1	0	1	1	A
+	1	0	1	0	B
1	0	1	1	0	OUTPUTS
CO	Σ3	Σ2	Σ1	Σ0	

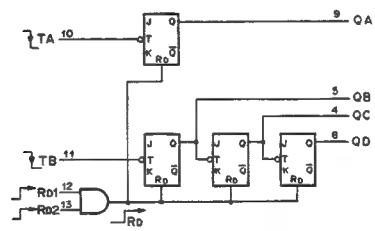
SN74293N (TI)
SN74LS293N (TI)

TTL 1-BIT AND 3-BIT BINARY COUNTER

—TOP VIEW—







COUNT SEQUENCE

÷2 SECTION

COUNT	QA
0	0
1	1

÷8 SECTION

COUNT	QD	QC	QB
0	0	0	0
1	0	0	1
2	0	1	0
3	0	1	1
4	1	0	0
5	1	0	1
6	1	1	0
7	1	1	1

RESET/COUNT FUNCTION

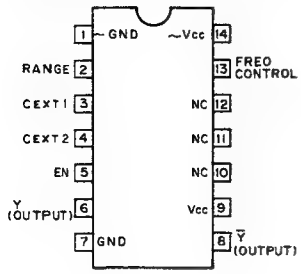
RESET IN		OUTPUTS			
R01	R02	QD	QC	QB	QA
1	1	0	0	0	0
X	0	COUNT			
0	X	COUNT			

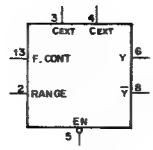
BVG-10

SN74LS324N (TI)

TTL VOLTAGE-CONTROLLED OSCILLATOR

— TOP VIEW —

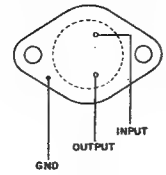




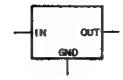
μA78□□KC (FSC)

POSITIVE VOLTAGE REGULATOR (1A)

— BOTTOM VIEW —



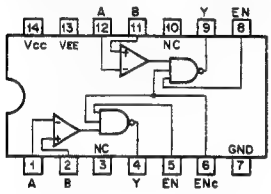
5V	μA7805KC
6V	μA7806KC
8V	μA7808KC
8.5V	μA7885KC
12V	μA7812KC
15V	μA7815KC
18V	μA7818KC
24V	μA7824KC



SN75207N (TI)
SN75207BN (TI)

BIPOLAR LINE RECEIVER (TTL COMPATIBLE)

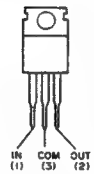
— TOP VIEW —



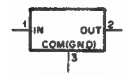
INPUTS			OUT
B−A	EN	ENc	Y
B−A ≧ 10mV	X	L	H
	L	X	H
	H	H	L
|B−A| < 10mV	X	L	H
	L	X	H
	H	H	?
B−A ≦ −10mV	X	X	H

μA780□UC (FSC)
FS780□ (SANKEN)
μPC1430□H (NEC)

POSITIVE VOLTAGE REGULATOR (1A)



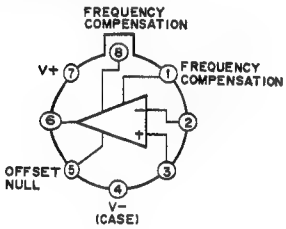
5V	μA7805UC	FS7805	μPC1430SH
6V	μA7806UC		
8V	μA7808UC		μPC1430BH
8.5V	μA7885UC		
12V	μA7812UC	FS7812	μPC1431 2H
15V	μA7815UC	FS7815	μPC1431 5H
18V	μA7818UC		
24V	μA7824UC	FS7824	



TA7506M (TOSHIBA)
LM301AH (NSC)

OPERATIONAL AMPLIFIER

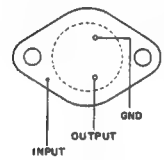
— BOTTOM VIEW —



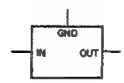
μA79□□KC (FSC)

NEGATIVE VOLTAGE REGULATOR (1A)

— BOTTOM VIEW —



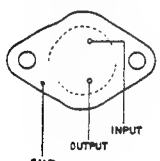
−5V	μA7905KC
−6V	μA7906KC
−8V	μA7908KC
−12V	μA7912KC
−15V	μA7915KC
−18V	μA7918KC
−24V	μA7924KC

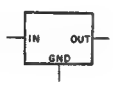


μA78H05ASC (FSC)

+5V VOLTAGE REGULATOR (5A)

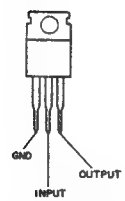
— BOTTOM VIEW —



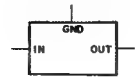


μA79□□UC (FSC)

NEGATIVE VOLTAGE REGULATOR (1A)

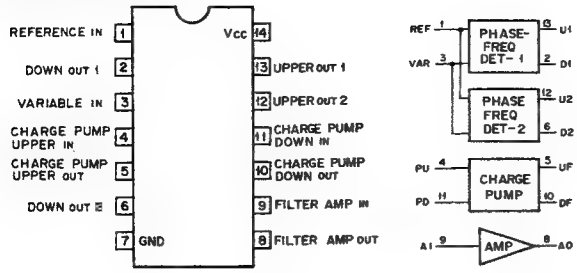


−5V	μA7905UC
−6V	μA7906UC
−8V	μA7908UC
−12V	μA7912UC
−15V	μA7915UC
−18V	μA7918UC
−24V	μA7924UC

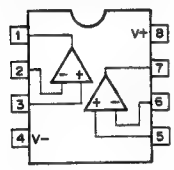


8VG-1000

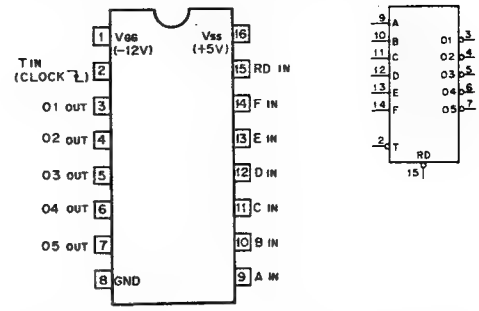
μPC1008C (NEC)
MC4044P (MOTOROLA)
PHASE / FREQ. DETECTOR
—TOP VIEW—

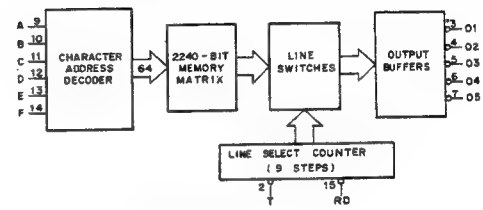


μPC4557C (NEC)
OPERATIONAL AMPLIFIER
(WIDE BAND, LOW NOISE)
—TOP VIEW—



3258DC (FSC)
MOS 64 x 7 x 5 CHARACTER GENERATOR
(64 CHARACTERS, 5 x 7 DOT MATRIX)
— TOP VIEW —





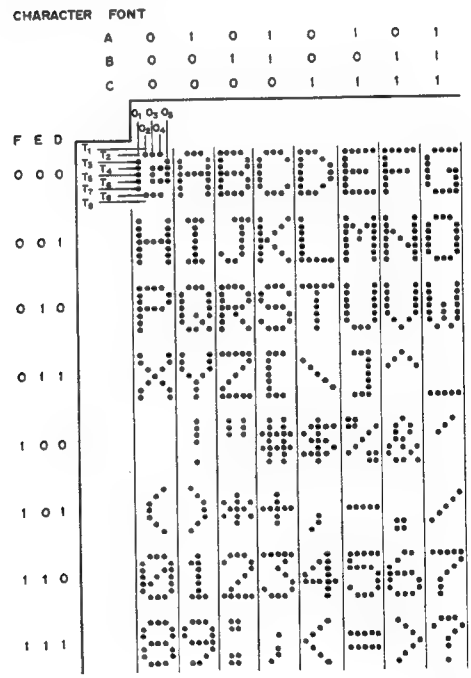
A, B, C, D, E, F ; CHARACTER ADDRESS INPUTS

T ; CLOCK INPUT (⊓)

RD ; RESET INPUT (⊓)

01, 02, 03, 04, 05 ; CHRACTER OUTPUTS

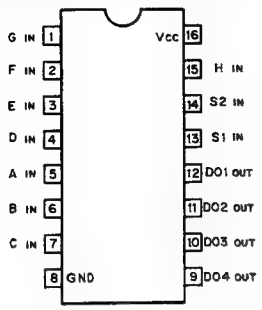
CHARACTER FONT

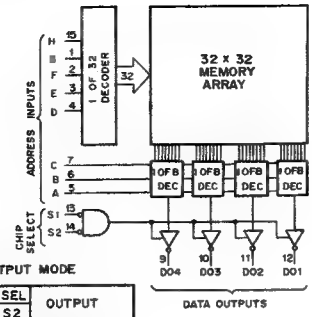


BVG-1000

SN74S287N (TI)
IM5623CJE (INTERSIL)
MB7052 (FUJITSU)
1024-BIT (256x 4) PROM (3-STATE OUTPUT)

—TOP VIEW—





OUTPUT MODE

CHIP SEL		OUTPUT
S1	S2	
0	0	ENABLE
X	1	HI-IMPEDANCE
1	X	

WORD/ADDRESS TABLE

WORD	ADDRESS INPUTS							
	H	G	F	E	D	C	B	A
0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1
2	0	0	0	0	0	0	1	0
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
253	1	1	1	1	1	1	0	1
254	1	1	1	1	1	1	1	0
255	1	1	1	1	1	1	1	1

DATA CODE/ACTUAL DATA

DATA CODE		ACTUAL DATA			
		DO4	DO3	DO2	DO1
0	0	0	0	0	0
1	1	0	0	0	1
2	2	0	0	1	0
3	3	0	0	1	1
4	4	0	1	0	0
5	5	0	1	0	1
6	6	0	1	1	0
7	7	0	1	1	1
8	8	1	0	0	0
9	9	1	0	0	1
10	A	1	0	1	0
11	B	1	0	1	1
12	C	1	1	0	0
13	D	1	1	0	1
14	E	1	1	1	0
15	F	1	1	1	1

IN HEXA-DECIMAL
IN DECIMAL

MB7052-BV1
SN74S287N-BV1
PROGRAMMED DATA

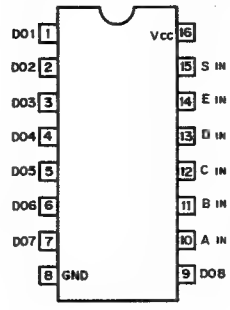
WORD (ADDRESS)	DATA OUTPUTS (IN HEXADECIMAL)
0 – 15	1. 1. 1. 1. 1. 1. 1. 1. 1. 3. 3. 3. 3. 1. 1. 1. 1.
16 – 31	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.
32 – 47	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.
48 – 63	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.
64 – 79	5. 5. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 5. 4.
80 – 95	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.
96 – 111	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.
112 – 127	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.
128 – 143	1. 1. 1. 1. 1. 1. 1. 1. 1. 3. 3. 3. 3. 1. 1. 1. 1.
144 – 159	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.
160 – 175	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.
176 – 191	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 9.
192 – 207	5. 5. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 4. 5. 4.
208 – 223	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.
224 – 239	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.
240 – 255	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.

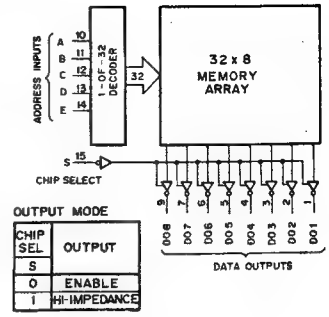
MB7052-BV2
SN74S287N-BV2
PROGRAMMED DATA

WORD (ADDRESS)	DATA OUTPUTS (IN HEXADECIMAL)
0 – 15	0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
16 – 31	2. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
32 – 47	0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
48 – 63	0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
64 – 79	6. D. 6. A. 6. A. 6. D. 6. D. 6. A. 6. A. C. D.
80 – 95	6. D. 6. A. 6. A. 6. D. 6. D. 6. A. 6. A. C. D.
96 – 111	6. D. 6. A. 6. A. 6. D. B. D. 6. A. 6. A. C. D.
112 – 127	6. D. 6. A. 6. A. 6. D. B. D. 6. A. 6. A. C. D.
128 – 143	0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
144 – 159	8. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
160 – 175	0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
176 – 191	0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
192 – 207	6. D. 6. A. 6. A. C. D. 6. D. 6. A. 6. A. 6. D.
208 – 223	8. D. 6. A. 6. A. 6. D. 0. 0. 0. 0. 0. 0. 0. 0.
224 – 239	B. D. 6. A. 6. A. C. D. 6. D. 6. A. 6. A. 6. D.
240 – 255	6. D. 6. A. 6. A. 6. D. 0. 0. 0. 0. 0. 0. 0. 0.

SN74S288N (TI)
IM5610CJE (INTERSIL)
MB7051 (FUJITSU)
256-BIT (32x 8) PROM (3-STATE OUTPUT)

—TOP VIEW—





OUTPUT MODE

CHIP SEL	OUTPUT
S	
0	ENABLE
1	HI-IMPEDANCE

MB7051-BV3
SN74S288N-BV3
PROGRAMMED DATA

WORD (ADDRESS)	DATA OUTPUTS (IN HEXADECIMAL)
0 – 15	00. 00. 00. 00. 00. 00. 00. 00. 00. 00. 00. 00. 00. 00. 00. 00.
16 – 31	03. F1. E1. 82. D1. C1. 82. B1. A1. 82. 91. 85. 00. 00. 00. 00.

BVG-1000

SECTION 4
ELECTRICAL ALIGNMENT
FOR NTSC

4-1. PREPARATION FOR ELECTRICAL ALIGNMENT

4-1-1. Test Equipment and Test Signal

(1) Oscilloscope; dual trace

(2) Digital DC Voltmeter

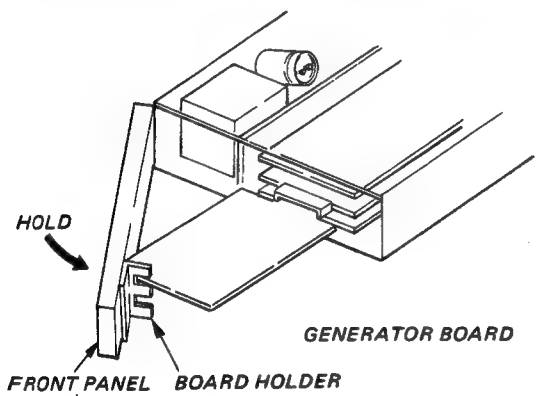
(3) Register; 1800 Ω, ¼ W: 3 pieces

(4) Color Test Signal

4-1-2. Regarding the use of the Extension Board

(1) Use of the Extension board is not recommended while the VIDEO board adjustment is attempted because the increased cross-talk makes adjustment difficult such that the VITC signal read-out becomes difficult.

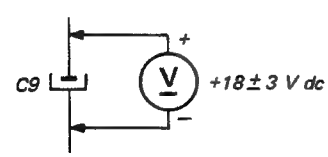
(2) Method to hold a printed board while it is connected via an Extension board. A metal board holder is equipped on the inside of the Front Panel in order that a printed board can be held by the metal holder as shown in the illustration. Top edge of the board holder can be used to hold the VIDEO board, the upper cut-out is for GENERATOR board, and the lower cut-out is for the READER board.



4-2. POWER SUPPLY SYSTEM CHECK

4-2-1. Unregulated +15 V Check

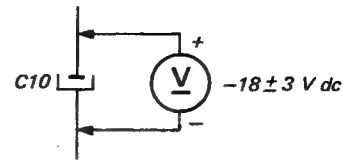
Spec.;



If measurement is out of spec, check AC power voltage and +15 V rectifier circuit.

4-2-2. Unregulated −15 V Check

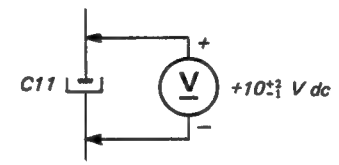
Spec.;



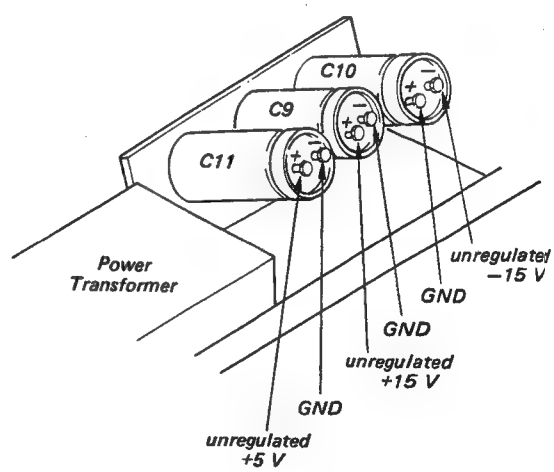
If measurement is out of sepc, check AC power voltage and −15 V rectifier circuit.

4-2-3. Unregulated +5 V Check

Spec.;



If measurement is out of spec, check AC power voltage and +5 V rectifier circuit.



4-2-4. Regulated +15 V Check

Spec.;
VIDEO board
CN1, pin 48 = +15 ±0.75 V dc
If measured voltage is out of spec, check the unregulated +15 V and IC1.

4-2-5. Regulated −15 V Check

Spec.;
VIDEO board
CN1, pin 49 = −15 ±0.75 V dc
If measured voltage is out of spec, check the unregulated −15 V and IC2.

4-2-6. Regulated +5 V Check

Spec.;
VIDEO board
CN1, pin 3 or 4 = +5 ±0.25 V dc
If measured voltage is out of spec, check the unregulated +5 V and IC3.

4-3. GENERATOR BOARD ADJUSTMENT

4-3-1. Preparation for GENERATOR Board Adjustment

GENERATOR VIDEO IN; NTSC signal (75 Ω: ON)

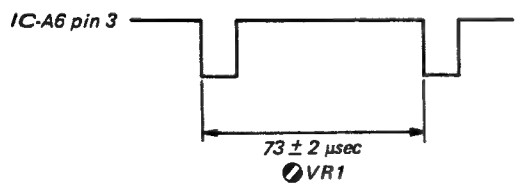
VIDEO board
NTSC/PAL/SECAM switch: NTSC
BLK/NORMAL switch: NORMAL
DIM/NORMAL switch: NORMAL
MEMORY/NORMAL switch: NORMAL

GENERATOR board
P. SET/NORMAL switch: NORMAL

4-3-2. 14 MHz VCO Frequency Adjustment

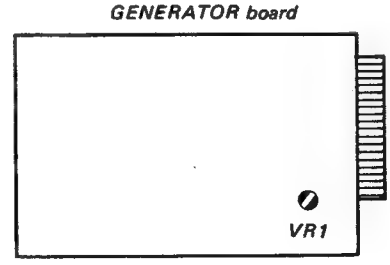
Serial No. 10,001 to 10,060; USA/CND

Preparation; Front Panel
REF select switch: SYNC
Same as Sec. 4-3-1, except Front Panel setting as shown above.
Equipment; Oscilloscope
Spec. and Adj.; GENERATOR board



Serial No. 10,061 and higher; USA/CND
Serial No. 10,001 and higher; AEP

Preparation; Front Panel
REF select switch: VIDEO
Same as Sec. 4-3-1, except Front Panel setting as shown above.
Equipment; Digital DC Voltmeter
Spec. and Adj.; GENERATOR board
IC-A7, pin 2 = 2.5 ±0.1 V dc
VR1



4-3-3. 4.8 kHz VCO Frequency Adjustment

Preparation; Front Panel
REF select switch: VIDEO
Same as Sec. 4-3-1, except Front Panel setting as shown above.

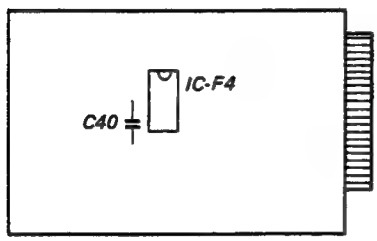
Equipment; Digital DC Voltmeter

Spec. and Adj.; GENERATOR board
IC-F4, pin 9 = 0.5 to 4.0 V dc
⊘ C40 (mylar)
Select a optimum value of a capacitor for C40. See table.

Capacitance	Parts No.
0.001 μF	1-108-227-00
0.0012 μF	1-108-351-00
0.0015 μF	1-108-228-00
0.0018 μF	1-108-352-00
0.0022 μF	1-108-230-00

decrease ↑ VOLTAGE ↓ increase

GENERATOR board



4-3-4. TIME CODE Start Timing Adjustment

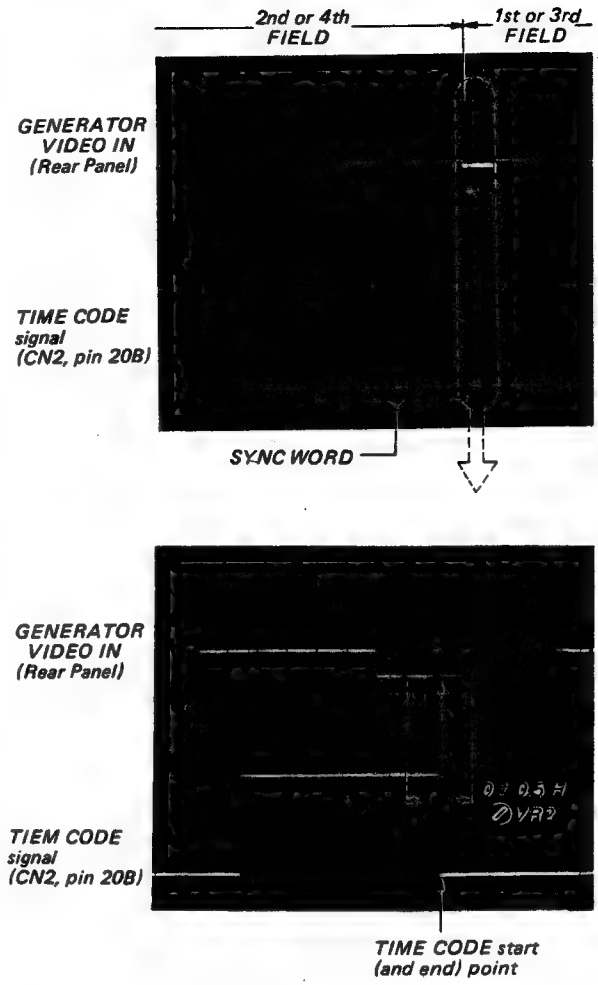
Preparation; Front Panel
SOURCE SELECT switch: REF
REF select switch: VIDEO
GENERATOR board
P. SET/NORMAL switch: P. SET
Same as Sec. 4-3-1, except Front Panel and GENERATOR board setting as shown above.

Equipment; Oscilloscope
CHOP mode
EXT TRIG: CN2, pin 18A/GENERATOR board
(–) slope

Spec. and Adj.;

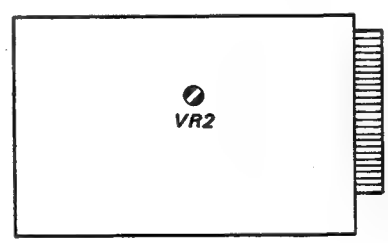
Step 1. Operate the HOLD switch to hold the display.
Operate the RESET switch to reset display to zero and the display should be kept in this state of hold until this adjustment is completed.

Step 2. GENERATOR board
⊘ VR2



Step 3. After adjustment, set the P. SET/NORMAL switch to NORMAL.

GENERATOR board



4-4. VIDEO BOARD ADJUSTMENT

4-4-1. Preparation for VIDEO Board Adjustment

VIDEO board
- NTSC/PAL/SECAM switch: NTSC
- BLK/NORMAL switch: NORMAL
- DIM/NORMAL switch: NORMAL
- MEMORY/NORMAL switch: NORMAL

4-4-2. Regarding the use of the Extension Board

Use of the Extension board is not recommended while the VIDEO board adjustment is attempted because the increased cross-talk makes adjustment difficult such that the VITC signal read-out becomes difficult.

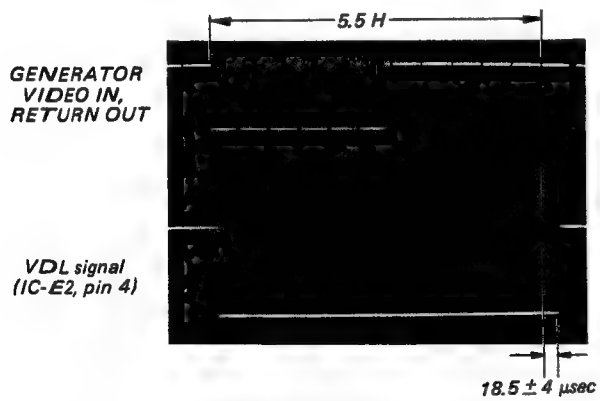
4-4-3. VDL Signal Timing Adjustment

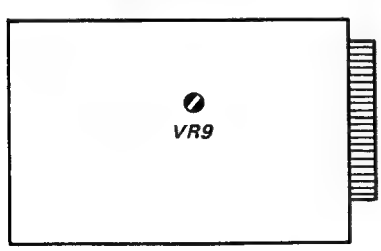
Serial No. 10,001 to 10,040; USA/CND

Preparation; GENERATOR VIDEO IN
NTSC Signal (75 Ω: OFF)
GENERATOR VIDEO IN, RETURN OUT
Connect 75 Ω termination plug.
Front Panel
REF select switch: VIDEO
Same as Sec. 4-4-1, except connection and Front Panel setting as shown above.

Equipment; Oscilloscope
CHOP mode
EXT TRIG: IC-E2, pin 4/VIDEO board

Spec. and Adj.; VIDEO board
⊘ VR9



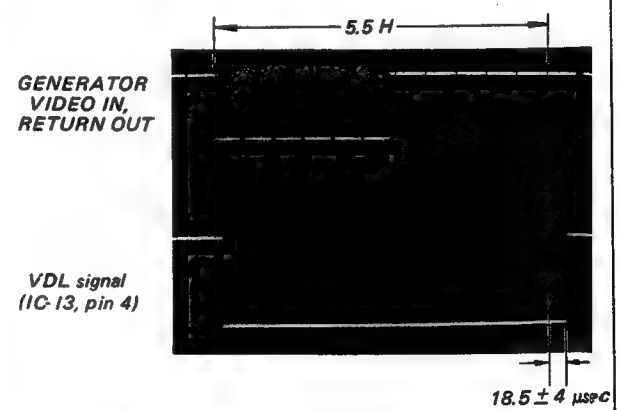


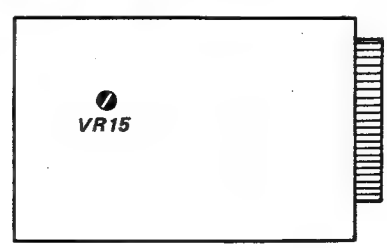
Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

Preparation; GENERATOR VIDEO IN
NTSC signal (75 Ω: OFF)
GENERATOR VIDEO IN, RETURN OUT
Connect 75 Ω termination plug.
Front Panel
REF select switch: VIDEO
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

Equipment; Oscilloscope
CHOP mode
EXT TRIG: IC-13, pin 4/VIDEO board

Spec. and Adj.; VIDEO board
⊘ VR15



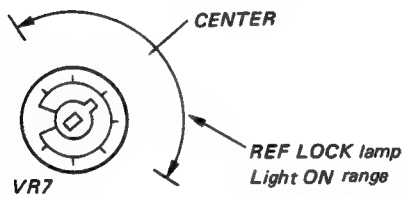


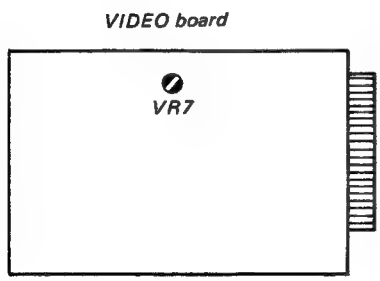
4-4-4. FRAME Signal Detector Adjustment

Serial No. 10,001 to 10,040; USA/CND

Preparation; GENERATOR VIDEO IN
NTSC signal (75 Ω: ON)
Front Panel
SOURCE SELECT switch: REF
REF select switch: VIDEO
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

Spec. and Adj.; VIDEO board
VR7
Turn the VR7 clock and counter-clockwise. Stop VR7 in the center of the Front Panel REF. LOCK lamp Light ON range. Turn VR7 very slowly because the lamp takes about 10 seconds to light (LOCK state) once after the lamp is turned OFF (LOCK is lost.)

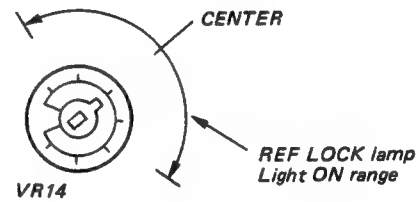


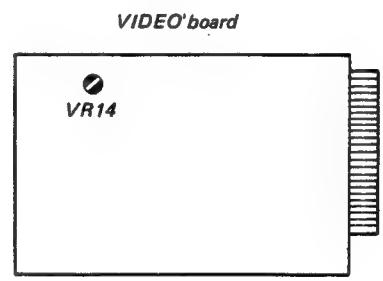


Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

Preparation; GENERATOR VIDEO IN
NTSC signal (75 Ω: ON)
Front Panel
SOURCE SELECT switch: REF
REF select switch; VIDEO
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

Spec. and Adj.; VIDEO board
VR14
Turn the VR14 clock and counter-clockwise. Stop VR14 in the center of the Front Panel REF. LOCK lamp Light ON range. Turn VR14 very slowly because the lamp takes about 10 seconds to light (LOCK state) once after the lamp is turned OFF (LOCK is lost.)

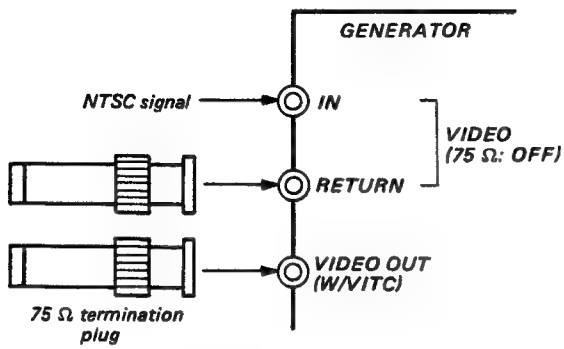




4-4-5. Video Output Level (GENERATOR) Adjustment

Serial No. 10,001 to 10,040; USA/CND

Preparation; Connection: BVG-1000



Same as Sec. 4-4-1, except Connection as shown above.

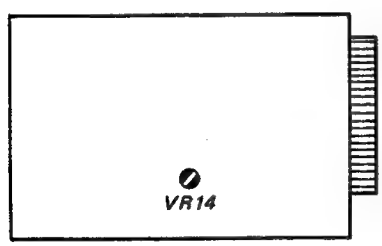
Equipment; Oscilloscope

Spec. and Adj.; VIDEO board
⊘ VR14

VIDEO OUT signal amplitude = VIDEO IN (at RETURN) signal amplitude

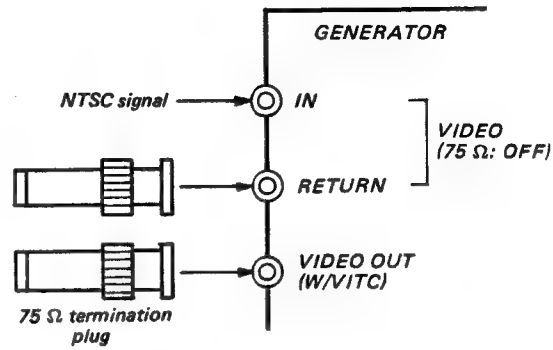
difference of amplitude = 0 ± 0.035 V (±5 IRE)

VIDEO board



Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

Preparation; Connection: BVG-1000



Same as Sec. 4-4-1, except Connection as shown above.

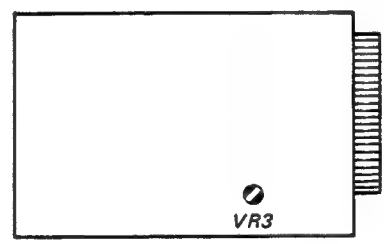
Equipment; Oscilloscope

Spec. and Adj.; VIDEO board
⊘ VR3

VIDEO OUT signal amplitude = VIDEO IN (at RETURN) signal amplitude

difference of amplitude = 0 ± 0.035 V (±5 IRE)

VIDEO board

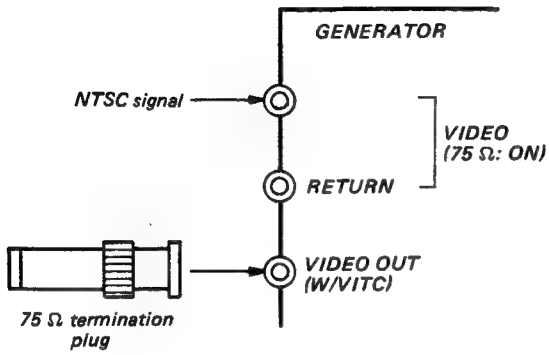


4-4-6. VITC Insertion Portion Pedestal Level (GENERATOR) Adjustment

Serial No. 10,001 to 10,040; USA/CND

Preparation; Connection:

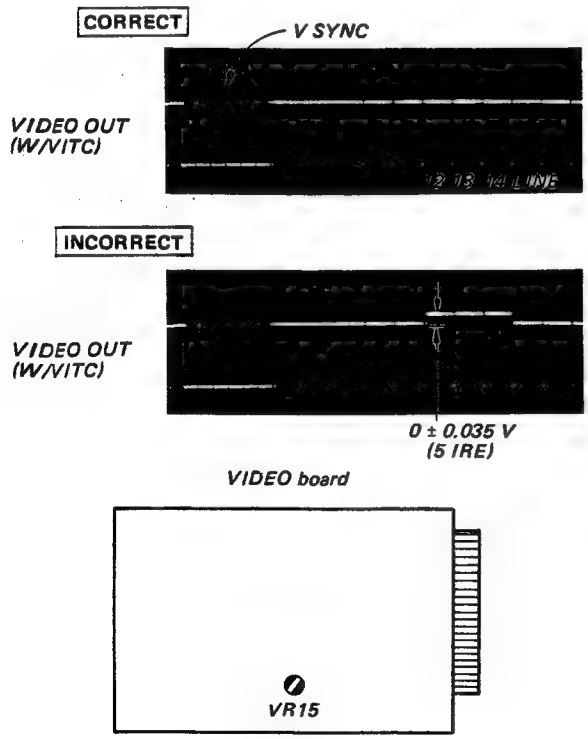
BVG-1000



Front Panel
REF select switch: VIDEO
VITC ON/OFF switch: OFF
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

Equipment; Oscilloscope
EXT TRIG: IC-B2, pin 6/VIDEO board

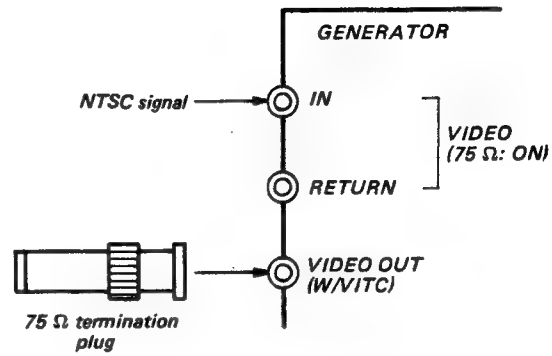
Spec. and Adj.; VIDEO board
VR15



Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

Preparation; Connection:

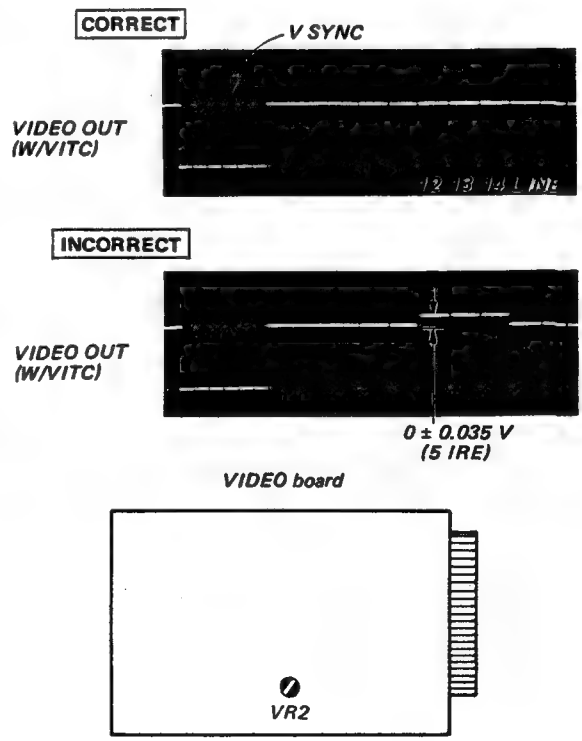
BVG-1000



Front Panel
REF select switch: VIDEO
VITC ON/OFF switch: OFF
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

Equipment; Oscilloscope
EXT TRIG: IC-A2, pin 6/VIDEO board

Spec. and Adj.; VIDEO board
VR2

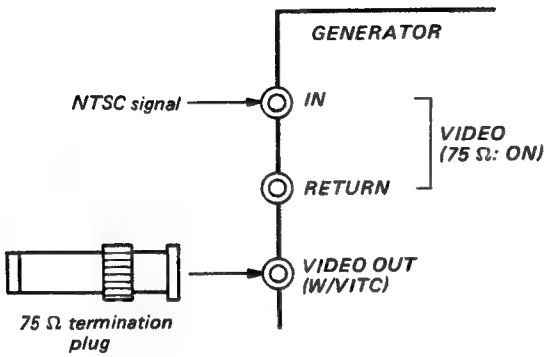


4-4-7. VITC Output Level (GENERATOR) Adjustment

Serial No. 10,001 to 10,040; USA/CND

Preparation; Connection:

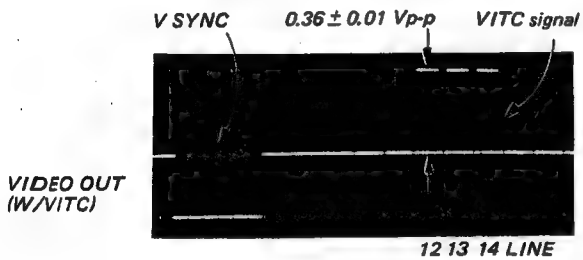
BVG-1000

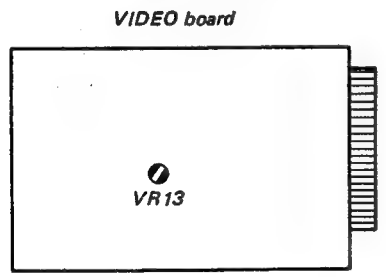


Front Panel
REF select switch: VIDEO
VITC ON/OFF switch: ON
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

Equipment; Oscilloscope
EXT TRIG: IC-B2, pin 6/VIDEO board

Spec. and Adj.; VIDEO board
VR13

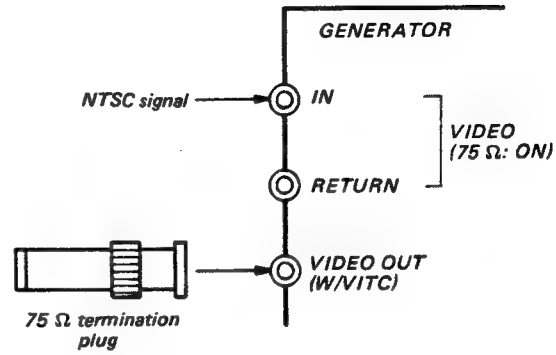




Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

Preparation; Connection:

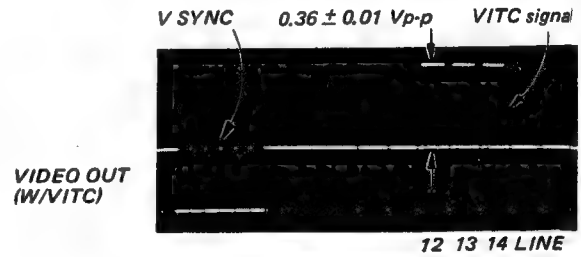
BVG-1000

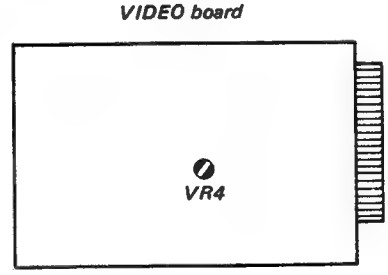


Front Panel
REF select switch: VIDEO
VITC ON/OFF switch: ON
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

Equipment; Oscilloscope
EXT TRIG: IC-A2, pin 6/VIDEO board

Spec. and Adj.; VIDEO board
VR4



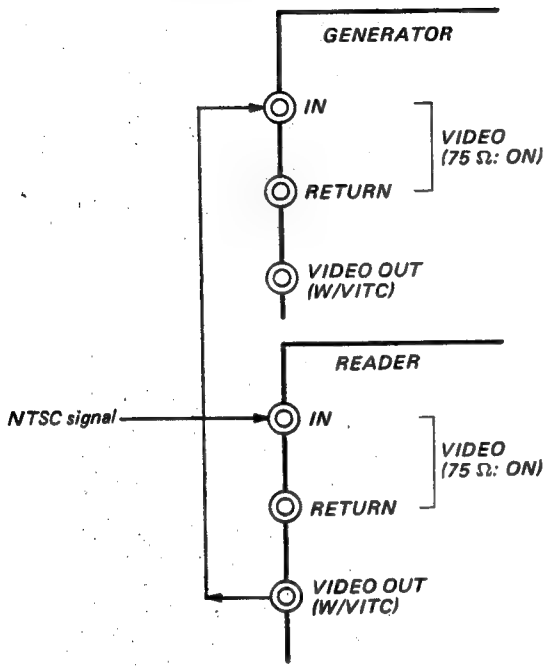


4-4-8. VITC Input Slice Level (GENERATOR) Adjustment

Serial No. 10,001 to 10,040; USA/CND

Preparation; Connection:

BVG-1000



Front Panel

GENERATOR/READER switch; GENERATOR

SOURCE SELECT switch; EXT CODE

REF select switch; VIDEO

VITC THRU/ON/OFF switch; ON

Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

Equipment; Oscilloscope

ALT mode

INPUT: DC mode

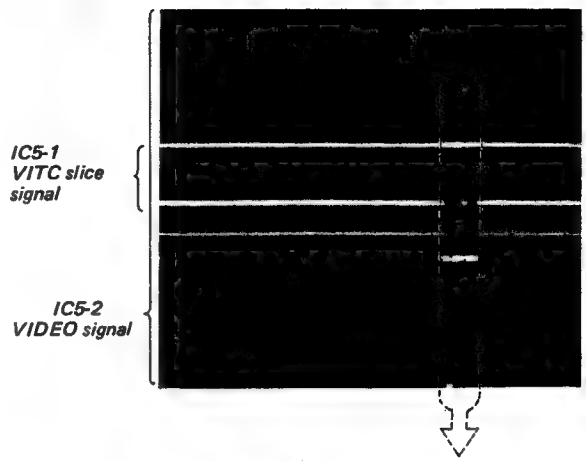
EXT TRIG: IC-B2, pin 6/VIDEO board

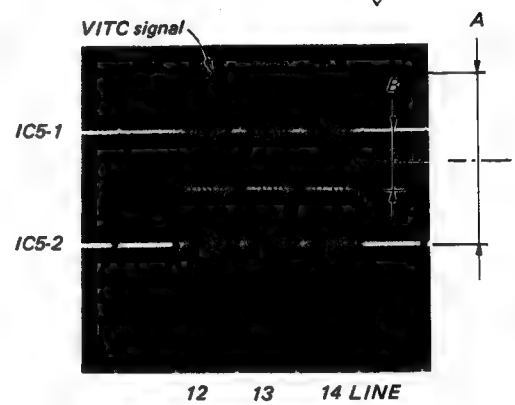
Spec. and Adj.;

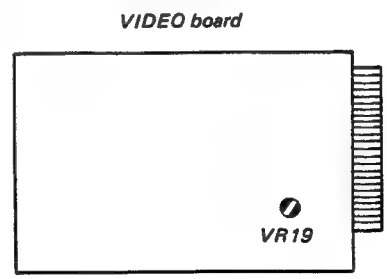
Step 1. Set the scope CH-1 and CH-2 VERT GAIN to 0.05 V/DIV.

Step 2. Set the scope INPUT of both CH-1 and CH-2 to GND mode and adjust the scope GND trace line to the bottom of scope scale.
Set then the both INPUT mode to the DC mode.

Step 3. VIDEO board
⊘VR19
Adjust so that the center of the VITC slice level "B" (IC5-1) and the center of the VITC signal level "A" (IC5-2) are on the same line on scope.



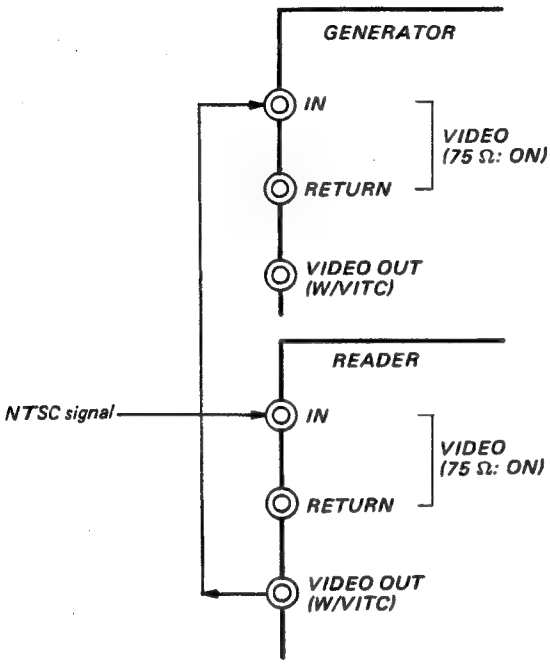




Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

Preparation; Connection:

BVG-1000



Front Panel
GENERATOR/READER switch; GENERATOR
SOURCE SELECT switch; EXT CODE
REF select switch; VIDEO
VITC THRU/ON/OFF switch; ON

Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

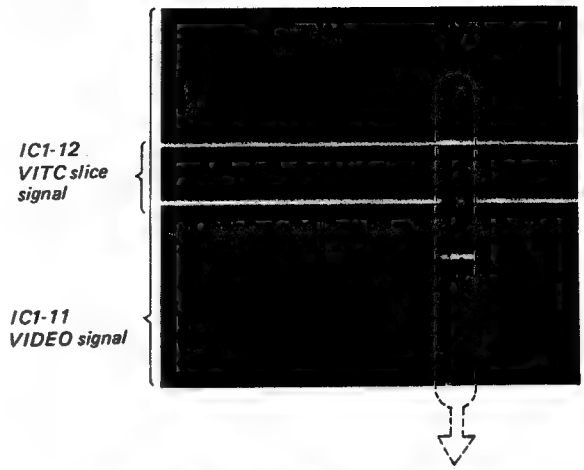
Equipment; Oscilloscope
ALT mode
INPUT: DC mode
EXT TRIG: IC-A2, pin 6/VIDEO board

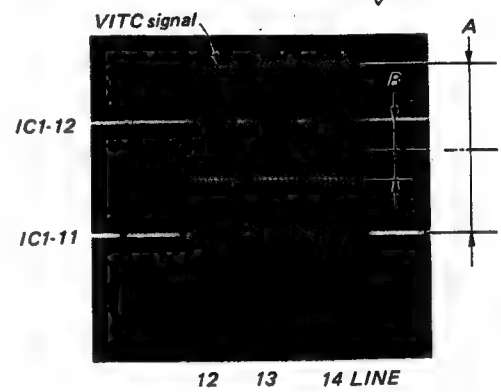
Spec. and Adj.;

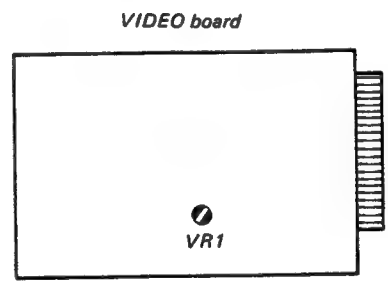
Step 1. Set the scope CH-1 and CH-2 VERT GAIN to 0.05 V/DIV.

Step 2. Set the scope INPUT of both CH-1 and CH-2 to GND mode and adjust the scope GND trace line to the bottom of scope scale.
Set then the both INPUT mode of the DC mode.

Step 3. VIDEO board
◐VR1
Adjust so that the center of the VITC slice level "B" (IC1-12), and the center of the VITC signal level "A" (IC1-11) are on the same line on scope.





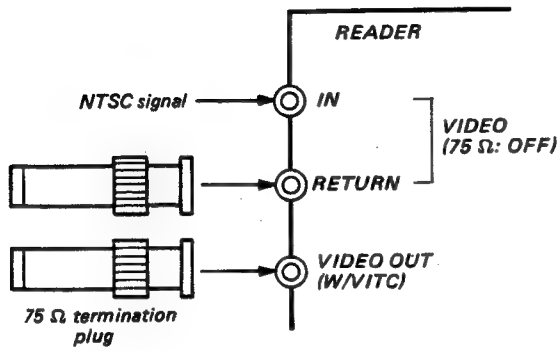


4-4-9. Video Output Level (READER; W/VITC) Adjustment

Serial No. 10,001 to 10,040; USA/CND

Preparation; Connection:

BVG-1000



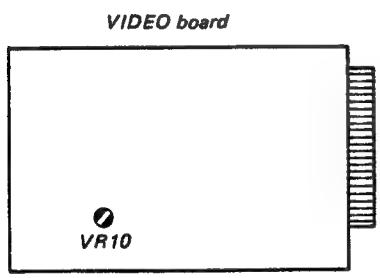
Same as Sec. 4-4-1, except Connection as shown above.

Equipment; Oscilloscope

Spec. and Adj.; VIDEO board
VR10

VIDEO OUT signal amplitude = VIDEO IN (at RETURN) signal amplitude

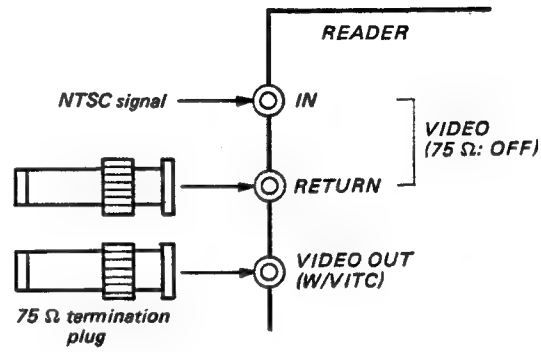
difference of amplitude = 0 ± 0.035 V (±5 IRE)



Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

Preparation; Connection:

BVG-1000



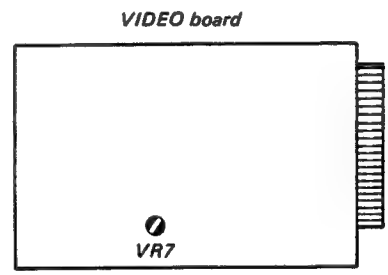
Same as Sec. 4-4-1, except Connection as shown above.

Equipment; Oscilloscope

Spec. and Adj.; VIDEO board
VR7

VIDEO OUT signal amplitude = VIDEO IN (at RETURN) signal amplitude

difference of amplitude = 0 ± 0.035 V (±5 IRE)

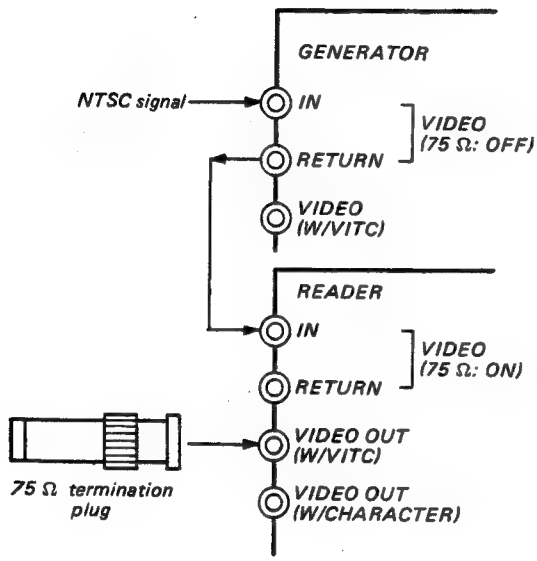


4-4-10. VITC Insertion Portion Pedestal Level (READER; W/VITC) Adjustment

Serial No. 10,001 to 10,040; USA/CND

Preparation; Connection:

BVG-1000

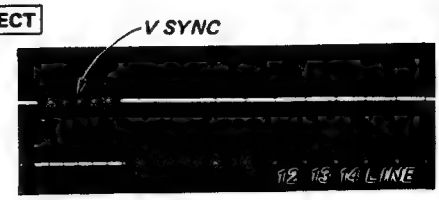


Front Panel
REF select switch: VIDEO
VITC THRU/ON/OFF switch: OFF
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

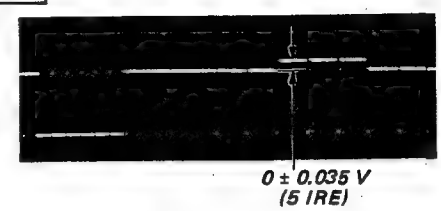
Equipment; Oscilloscope
EXT TRIG: IC-B2, pin 6/VIDEO board

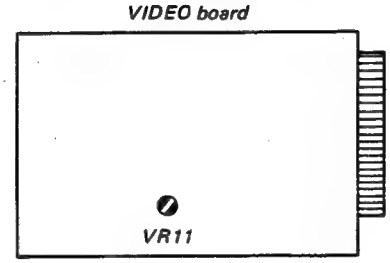
Spec. and Adj.; VIDEO board
⊘VR11

CORRECT



INCORRECT

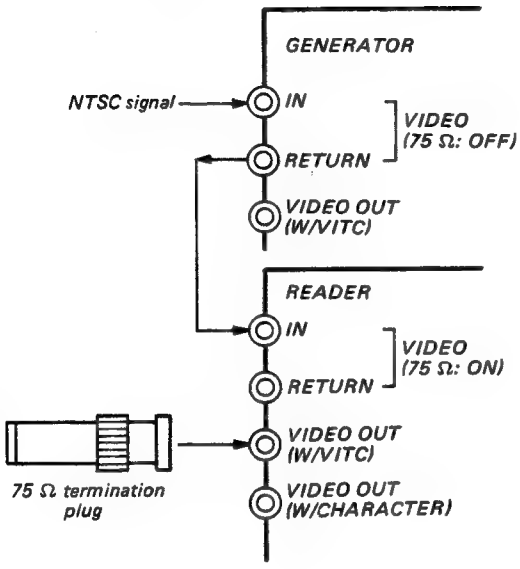




Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

Preparation; Connection:

BVG-1000

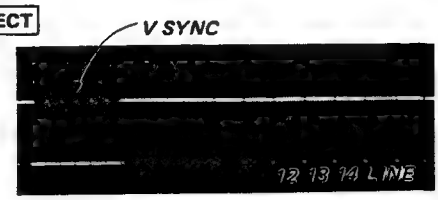


Front Panel
REF select switch: VIDEO
VITC THRU/ON/OFF switch: OFF
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

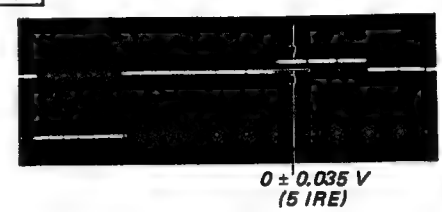
Equipment; Oscilloscope
EXT TRIG; IC-A2, pin 6/VIDEO board

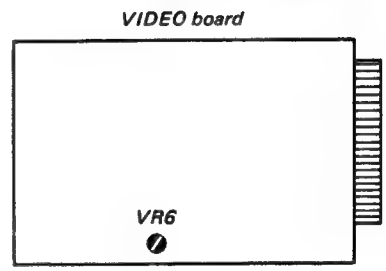
Spec. and Adj.; VIDEO board
⊘ VR6

CORRECT



INCORRECT



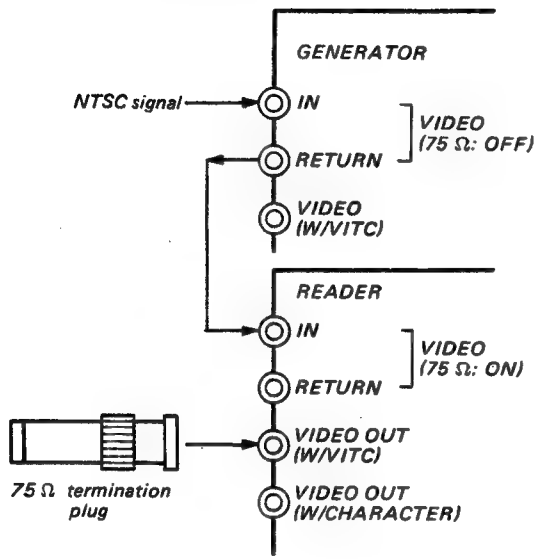


4-4-11. VITC Output Level (READER; W/VITC) Adjustment

Serial No. 10,001 to 10,040; USA/CND

Preparation; Connection:

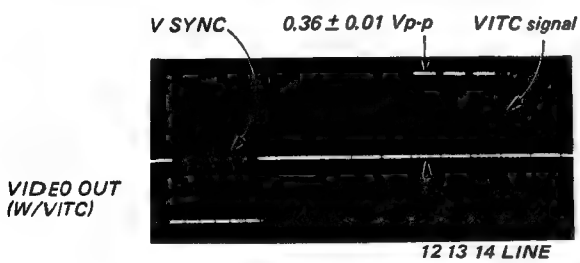
BVG-1000

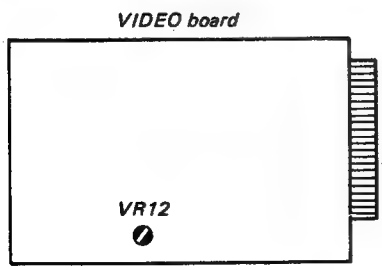


Front Panel
REF select switch: VIDEO
VITC THRU/ON/OFF switch: ON
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

Equipment; Oscilloscope
EXT TRIG: IC-B2, pin 6/VIDEO board

Spec. and Adj.; VIDEO board
VR12

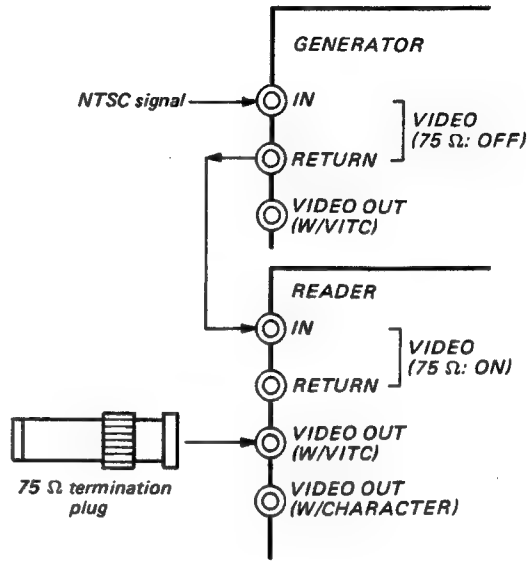




Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

Preparation; Connection:

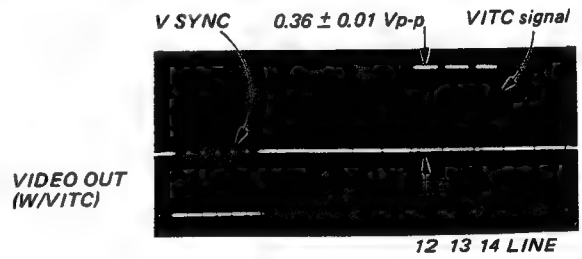
BVG-1000

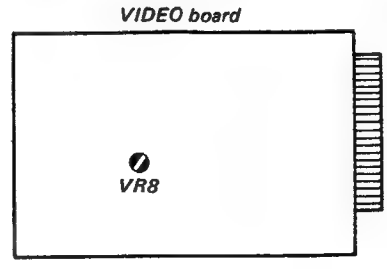


Front Panel
REF select switch: VIDEO
VITC THRU/ON/OFF switch: ON
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

Equipment; Oscilloscope
EXT TRIG: IC-A2, pin 6/VIDEO board

Spec. and Adj.; VIDEO board
VR8



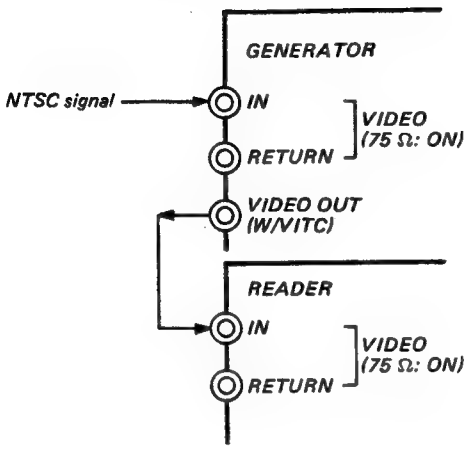


4-4-12. VITC Input Slice Level (READER) Adjustment

Serial No. 10,001 to 10,040; USA/CND

Preparation; Connection:

BVG-1000



Front Panel
GENERATOR/READER switch: GENERATOR
SOURCE SELECT switch: REF
REF select switch: VIDEO
VITC ON/OFF switch: ON
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

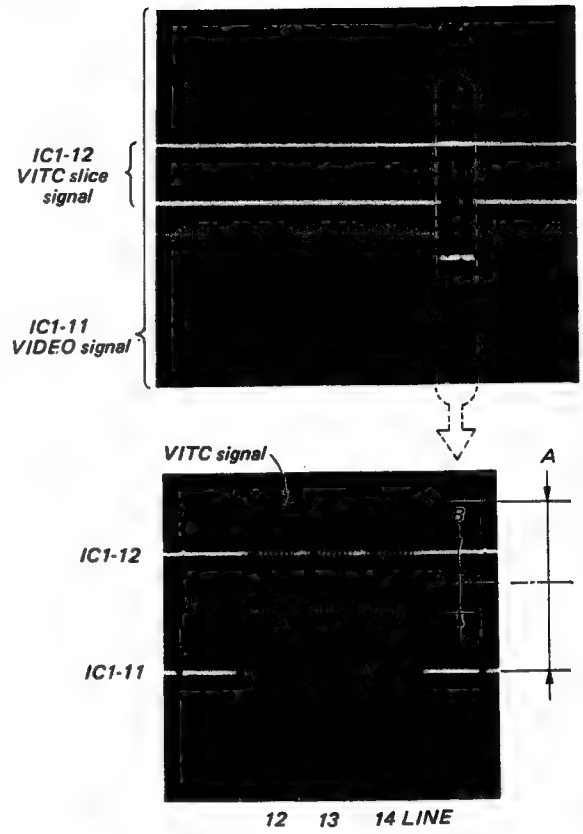
Equipment; Oscilloscope
ALT mode
INPUT: DC mode
EXT TRIG: IC-B2, pin 6/VIDEO board

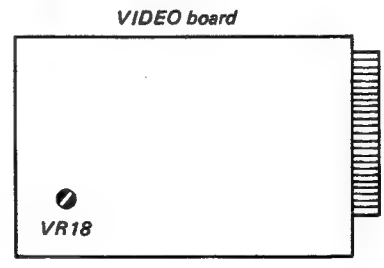
Spec. and Adj.;

Step 1. Set the scope CH-1 and CH-2 VERT GAIN to 0.05 V/DIV.

Step 2. Set the scope INPUT of both CH-1 and CH-2 to GND mode and adjust the scope GND trace line to the bottom of scope scale.
Set then the both INPUT mode to the DC mode.

Step 3. VIDEO board
⊘VR18
Adjust so that the center of the VITC slice level "B" (IC1-12), and the center of the VITC signal level "A" (IC1-11) are on the same line on scope.

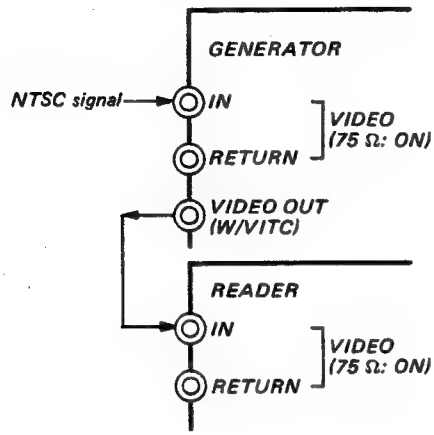




Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

Preparation; Connection:

BVG-1000



Front Panel
GENERTOR/READER switch: GENERATOR
SOURCE SELECT switch: REF
REF select switch: VIDEO
VITC ON/OFF switch: ON
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

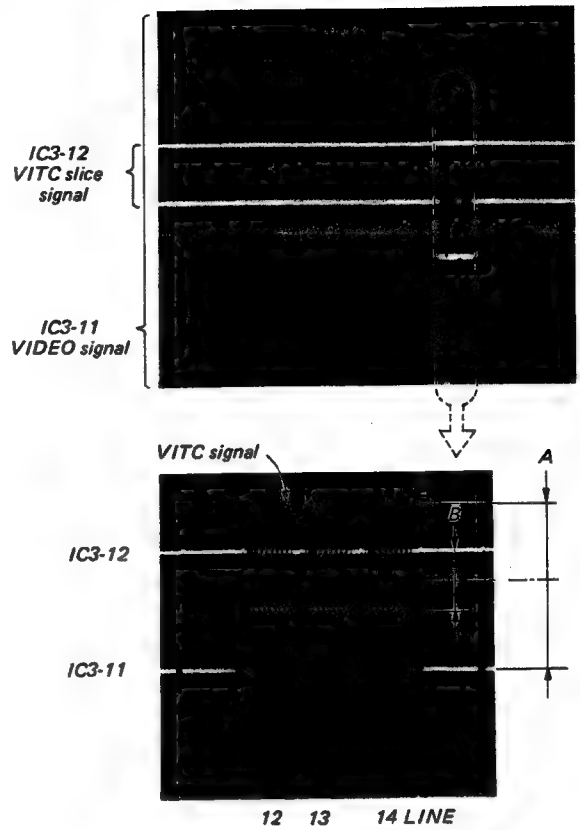
Equipment; Oscilloscope
ALT mode
INPUT: DC mode
EXT TRIG: IC-A2, pin 6/VIDEO board

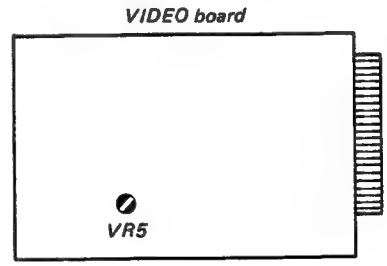
Spec. and Adj.;

Step 1. Set the scope CH-1 and CH-2 VERT GAIN to 0.05 V/DIV.

Step 2. Set the scope INPUT of both CH-1 and CH-2 to GND mode and adjust the scope GND trace line to the bottom of scope scale.
Set then the both INPUT mode of the DC mode.

Step 3. VIDEO board
⊘ VR5
Adjust so that the center of the VITC slice level "B" (IC3-12), and the center of the VITC signal level "A" (IC3-11) are on the same line on scope.



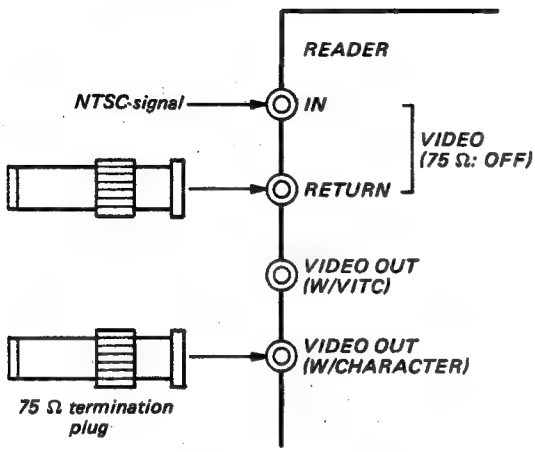


4-4-13. Video Output Level (READER; W/CHARACTER) Adjustment

Serial No. 10,001 to 10,040; USA/CND

Preparation; Connection:

BVG-1000



Same as Sec. 4-4-1, except Connection as shown above.

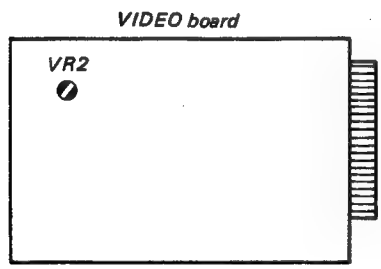
Equipment; Oscilloscope

Spec. and Adj.; VIDEO board

⊘ VR2

VIDEO OUT signal amplitude = VIDEO IN (at RETURN) signal amplitude

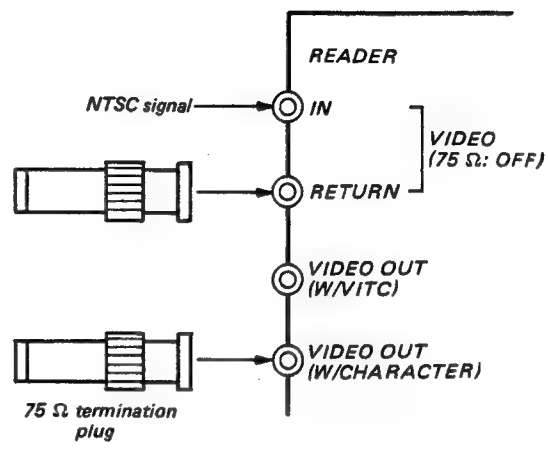
difference of amplitude = 0 ± 0.035 V (±5 IRE)



Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

Preparation; Connection:

BVG-1000



Same as Sec. 4-4-1, except Connection as shown above.

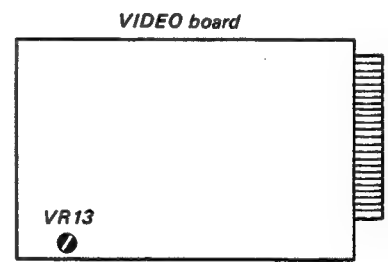
Equipment; Oscilloscope

Spec. and Adj.; VIDEO board

⊘ VR13

VIDEO OUT signal amplitude = VIDEO IN (at RETURN) signal amplitude

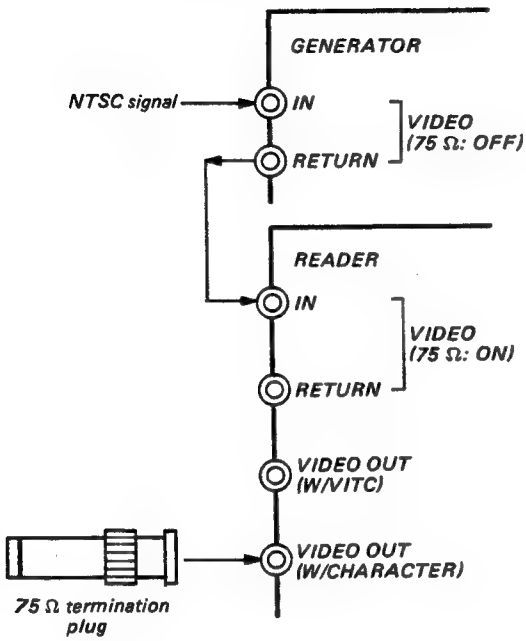
difference of amplitude = 0 ± 0.035 V (±5 IRE)



4-4-14. VITC Insertion Portion Pedestal Level (READER; W/CHARACTER) Adjustment

Serial No. 10,001 to 10,040; USA/CND

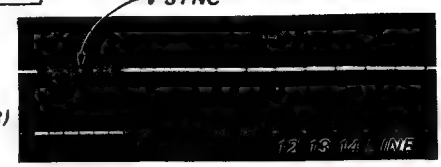
Preparation; Connection:
BVG-1000



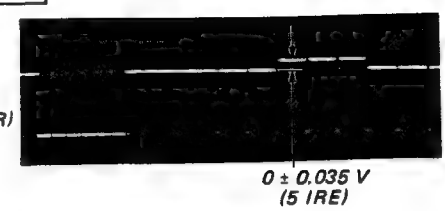
Front Panel
REF select switch: VIDEO
VITC THRU/ON/OFF switch: OFF
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

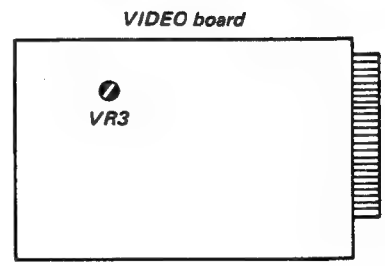
Equipment; Oscilloscope
EXT TRIG: IC-B2,pin 6/VIDEO board
Spec. and Adj.; VIDEO board
⊘ VR3

CORRECT



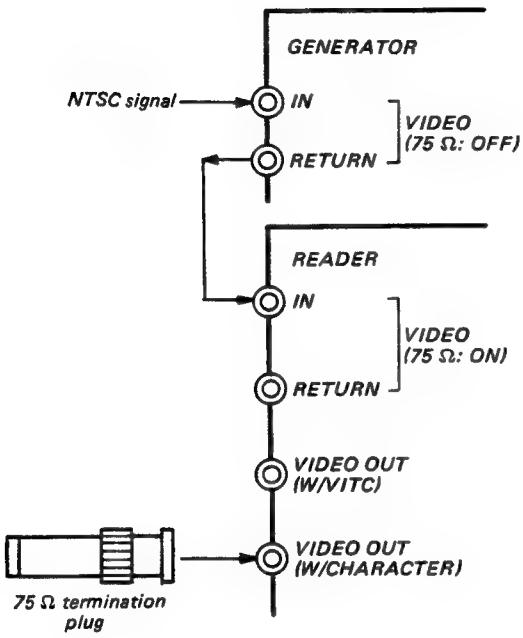
INCORRECT





Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

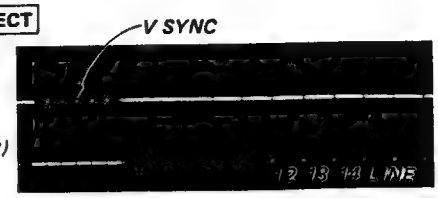
Preparation; Connection:
BVG-1000



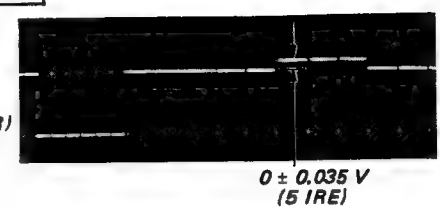
Front Panel
REF select switch; VIDEO
VITC THRU/ON/OFF switch; OFF
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

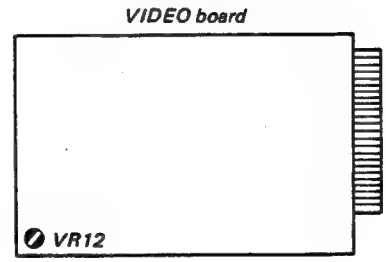
Equipment; Oscilloscope
EXT TRIG: IC-A2, pin 6/VIDEO board
Spec. and Adj.; VIDEO board
⊘ VR12

CORRECT



INCORRECT



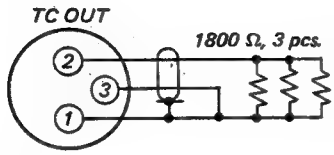


4-4-15. TIME CODE Output Level (GENERATOR) Adjustment

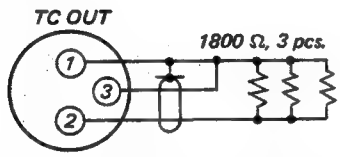
Serial No. 10,001 to 10,040; USA/CND

Preparation; Connection
Terminate the GENERATOR TC OUT with 600 Ω unbalanced as shown.
(Use three pieces of 1800 Ω resistor.)

USA/CND/AEP

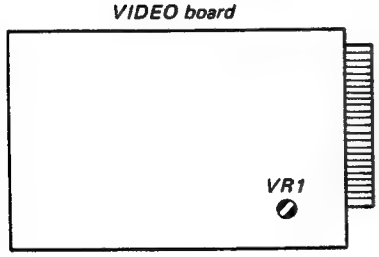


JAPAN



Same as Sec. 4-4-1, except Connection as shown above.

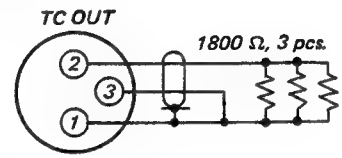
Equipment; Oscilloscope
Spec. and Adj.; VIDEO board
⊘ VR1



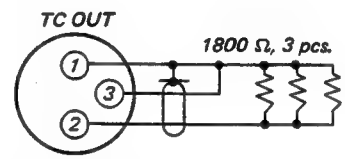
Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

Preparation; Connection
Terminate the GENERATOR TC OUT with 600 Ω unbalanced as shown.
(Use three pieces of 1800 Ω resistor.)

USA/CND/AEP

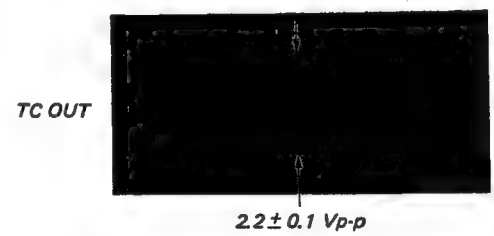


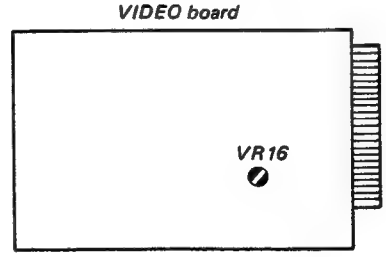
JAPAN



Same as Sec. 4-4-1, except Connection as shown above.

Equipment; Oscilloscope
Spec. and Adj.; VIDEO board
⊘ VR16



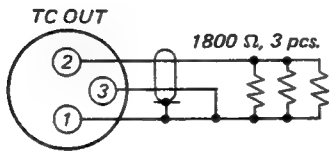


4-4-16. TIME CODE Output Level (READER) Adjustment

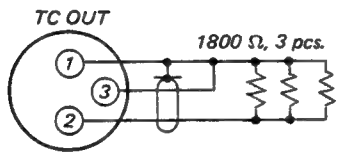
Serial No. 10,001 to 10,040; USA/CND

Preparation; Connection
Terminate the READER TO OUT with 600 Ω unbalanced as shown. (Use three pieces of 1800 Ω resistor.)

USA/CND/AEP

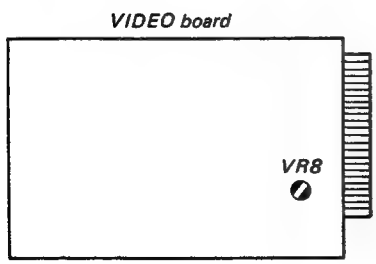


JAPAN



READER board
THRU/NORMAL switch: NORMAL
Same as Sec. 4-4-1, except Connection and READER board setting as shown above.

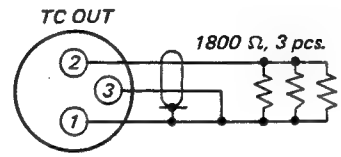
Equipment; Oscilloscope
Spec. and Adj.; VIDEO board
⊘ VR8



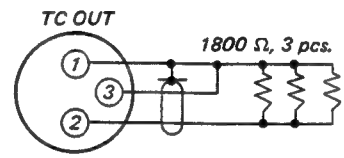
Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

Preparation; Connection
Terminate the READER TC OUT with 600 Ω unbalanced as shown. (Use three pieces of 1800 Ω resistor.)

USA/CND/AEP

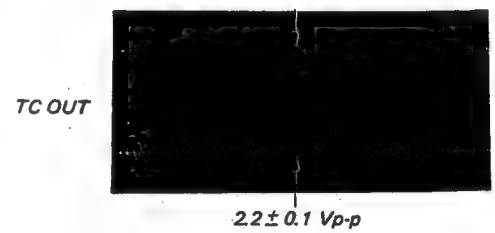


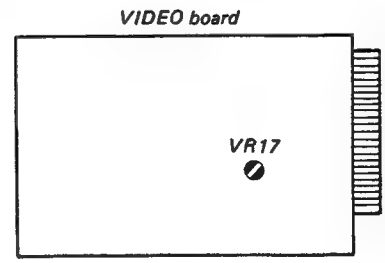
JAPAN



READER board
THRU/NORMAL switch: NORMAL
Same as Sec. 4-4-1, except Connection and READER board setting as shown above.

Equipment; Oscilloscope
Spec. and Adj.; VIDEO board
⊘ VR17

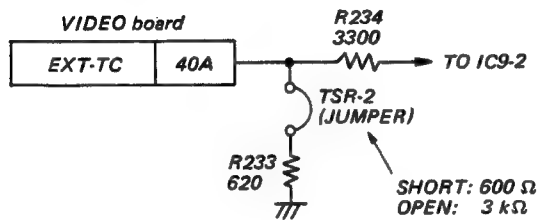




4-4-17. TIME CODE Input Slice Level (GENERATOR) Adjustment

Serial No. 10,001 to 10,040; USA/CND

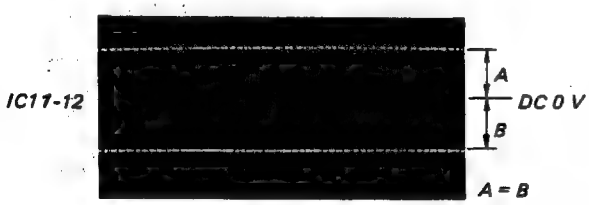
Preparation; Connection
Supplied the GENERATOR TC OUT to the GENERATOR TC IN.
Front Panel
GENERATOR/READER switch: GENERATOR
SOURCE SELECT switch: EXT CODE
VIDEO board
Set the TC IN input impedance to 600 Ω.
Impedance of the TC IN can be selected to either 600 Ω or 3 kΩ by a jumper (TSR-2) on the VIDEO board.



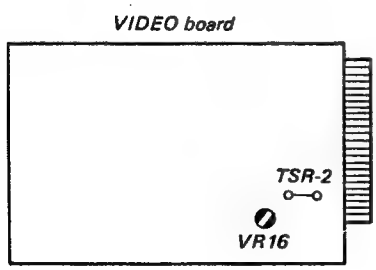
The TSR-2 should be shorted by a jumper to obtain 600Ω input impedance.
Same as Sec. 4-4-1, except Connection, Front Panel and VIDEO board setting as shown above.

Equipment; Oscilloscope
INPUT mode: DC

Spec. and Adj.; VIDEO board
VR16

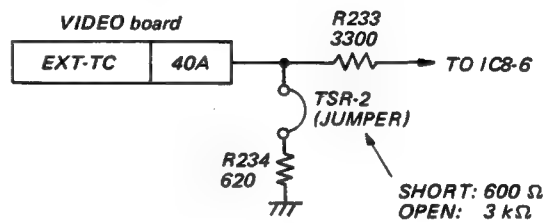


After adjustment, reset the TSR-2 (jumper) to the original state of starting the adjustment.



Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

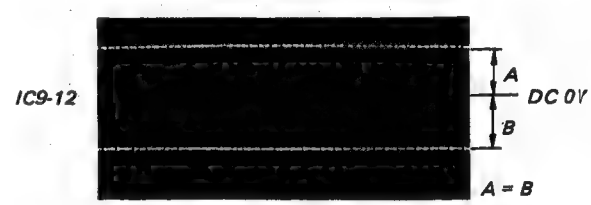
Preparation; Connection
Supplied the GENERATOR TC OUT to the GENERATOR TC IN.
Front Panel
GENERATOR/READER switch: GENERATOR
SOURCE SELECT switch: EXT CODE
VIDEO board
Set the TC IN input impedance to 600 Ω.
Impedance of the TC IN can be selected to either 600 Ω or 3 kΩ by a jumper (TSR-2) on the VIDEO board.



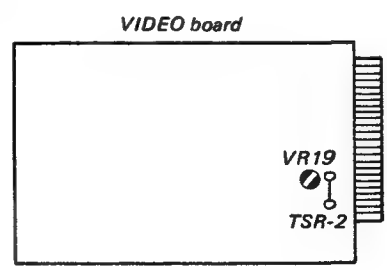
The TSR-2 should be shorted by a jumper to obtain 600Ω input impedance.
Same as Sec. 4-4-1, except Connection, Front Panel and VIDEO board setting as shown above.

Equipment; Oscilloscope
INPUT mode: DC

Spec. and Adj.; VIDEO board
VR19



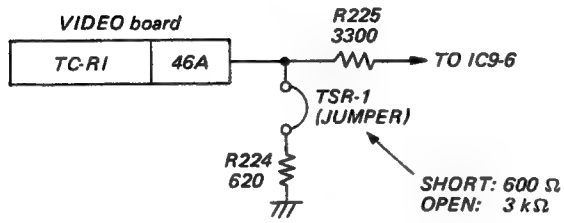
After adjustment, reset the TSR-2 (jumper) to the original state of starting the adjustment.



4-4-18. TIME CODE Input Slice Level (READER) Adjustment

Serial No. 10,001 to 10,040; USA/CND

Preparation; Connection
Supplied the GENERATOR TC OUT to the READER TC IN.
Front Panel
SOURCE SELECT switch: REF
VIDEO board
Set the TC IN input impedance to 600 Ω.
Impedance of the TC IN can be selected to either 600 Ω or 3 kΩ by a jumper (TSR-1) on the VIDEO board.



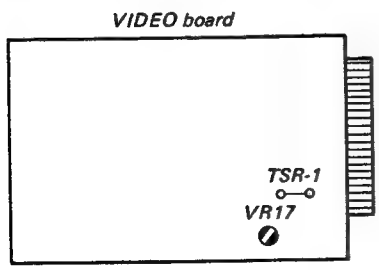
The TSR-1 should be shorted by a jumper to obtain 600Ω input impedance.

Same as Sec. 4-4-1, except Connection, Front Panel and VIDEO board setting as shown above.

Equipment; Oscilloscope
INPUT mode: DC

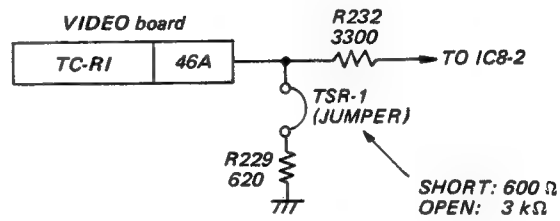
Spec. and Adj.; VIDEO board
VR17

After adjustment, reset the TSR-1 (jumper) to the original state of starting the adjustment.



Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

Preparation; Connection
Supplied the GENERATOR TC OUT to the READER TC IN.
Front Panel
SOURCE SELECT switch: REF
VIDEO board
Set the TC IN input impedance to 600 Ω.
Impedance of the TC IN can be selected to either 600 Ω or 3 kΩ by a jumper (TSR-1) on the VIDEO board.



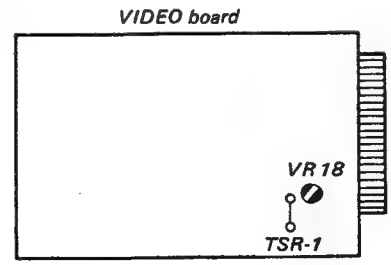
The TSR-1 should be shorted by a jumper to obtain 600Ω input impedance.

Same as Sec. 4-4-1, except Connection, Front Panel and VIDEO board setting as shown above.

Equipment; Oscilloscope
INPUT mode: DC

Spec. and Adj.; VIDEO board
VR18

After adjustment, reset the TSR-1 (jumper) to the original state of starting the adjustment.



SECTION 4
ELECTRICAL ALIGNMENT
FOR PAL/SECAM

4-1. PREPARATION FOR ELECTRICAL ALIGNMENT

4-1-1. Test Equipment and Test Signal

(1) Oscilloscope; dual trace

(2) Digital DC Voltmeter

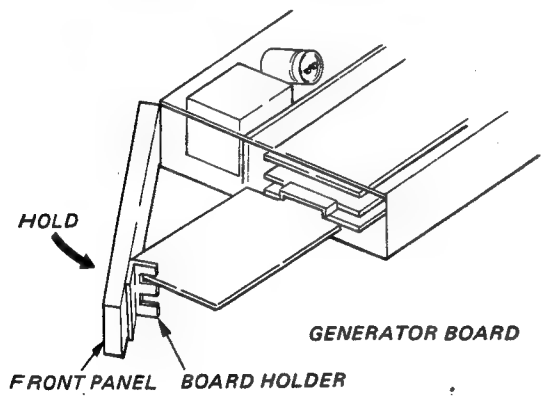
(3) Register; 1800 Ω, ¼ W: 3 pieces

(4) Color Test Signal

4-1-2. Regarding the use of the Extension Board

(1) Use of the Extension board is not recommended while the VIDEO board adjustment is attempted because the increased cross-talk makes adjustment difficult such that the VITC signal read-out becomes difficult.

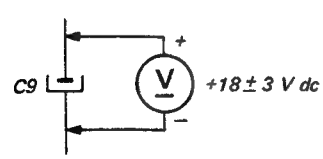
(2) Method to hold a printed board while it is connected via an Extension board. A metal board holder is equipped on the inside of the Front Panel in order that a printed board can be held by the metal holder as shown in the illustration. Top edge of the board holder can be used to hold the VIDEO board, the upper cut-out is for GENERATOR board, and the lower cut-out is for the READER board.



4-2. POWER SUPPLY SYSTEM CHECK

4-2-1. Unregulated +15 V Check

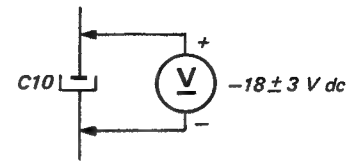
Spec.;



If measurement is out of spec, check AC power voltage and +15 V rectifier circuit.

4-2-2. Unregulated −15 V Check

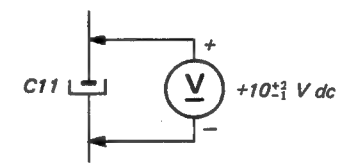
Spec.;



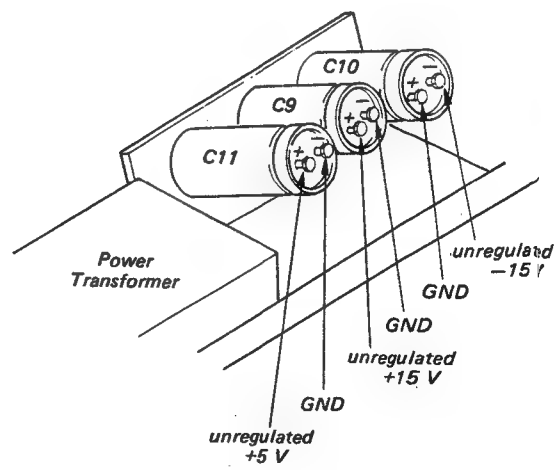
If measurement is out of sepc, check AC power voltage and −15 V rectifier circuit.

4-2-3. Unregulated +5 V Check

Spec.;



If measurement is out of spec, check AC power voltage and +5 V rectifier circuit.



4-2-4. Regulated +15 V Check

Spec.;
VIDEO board
CN1, pin 48 = +15 ±0.75 V dc
If measured voltage is out of spec, check the unregulated +15 V and IC1.

4-2-5. Regulated −15 V Check

Spec.;
VIDEO board
CN1, pin 49 = −15 ±0.75 V dc
If measured voltage is out of spec, check the unregulated −15 V and IC2.

4-2-6. Regulated +5 V Check

Spec.;
VIDEO board
CN1, pin 3 or 4 = +5 ±0.25 V dc
If measured voltage is out of spec, check the unregulated +5 V and IC3.

4-3. GENERATOR BOARD ADJUSTMENT

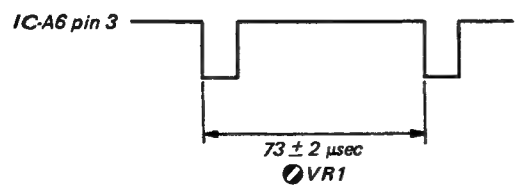
4-3-1. Preparation for GENERATOR Board Adjustment

GENERATOR VIDEO IN; PAL or SECAM signal (75 Ω: ON)
VIDEO board
NTSC/PAL/SECAM switch: PAL or SECAM
BLK/NORMAL switch: NORMAL
DIM/NORMAL switch: NORMAL
MEMORY/NORMAL switch: NORMAL
GENERATOR board
P. SET/NORMAL switch: NORMAL

4-3-2. 14 MHz VCO Frequency Adjustment

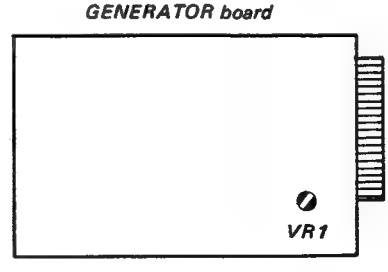
Serial No. 10,001 to 10,060; USA/CND

Preparation; Front Panel
REF select switch: SYNC
Same as Sec. 4-3-1, except Front Panel setting as shown above.
Equipment; Oscilloscope
Spec. and Adj.; GENERATOR board



Serial No. 10061 and higher; USA/CND
Serial No. 10,001 and higher; AEP

Preparation; Front Panel
REF select switch: VIDEO
Same as Sec. 4-3-1, except Front Panel setting as shown as preparation.
Equipment; Digital DC Voltmeter
Spec. and Adj.; GENERATOR board
IC-A7, pin 2 = 2.5 ±0.1 V dc
VR1



4-3-3. 4 kHz VCO Frequency Adjustment

Preparation; Front Panel
REF select switch: VIDEO
Same as Sec. 4-3-1, except Front Panel setting as shown above.

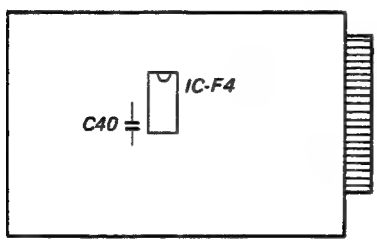
Equipment; Digital DC Voltmeter

Spec. and Adj.; GENERATOR board
IC-F4, pin 9 = 0.5 to 3.0 V dc
⊘ C40 (mylar)
Select a optimum value of a capacitor for C40. See table.

Capacitance	Parts No.
0.001 μF	1-108-227-00
0.0012 μF	1-108-351-00
0.0015 μF	1-108-228-00
0.0018 μF	1-108-352-00
0.0022 μF	1-108-230-00

decrease ↑ VOLTAGE ↓ increase

GENERATOR board



4-3-4. TIME CODE Start Timing Adjustment

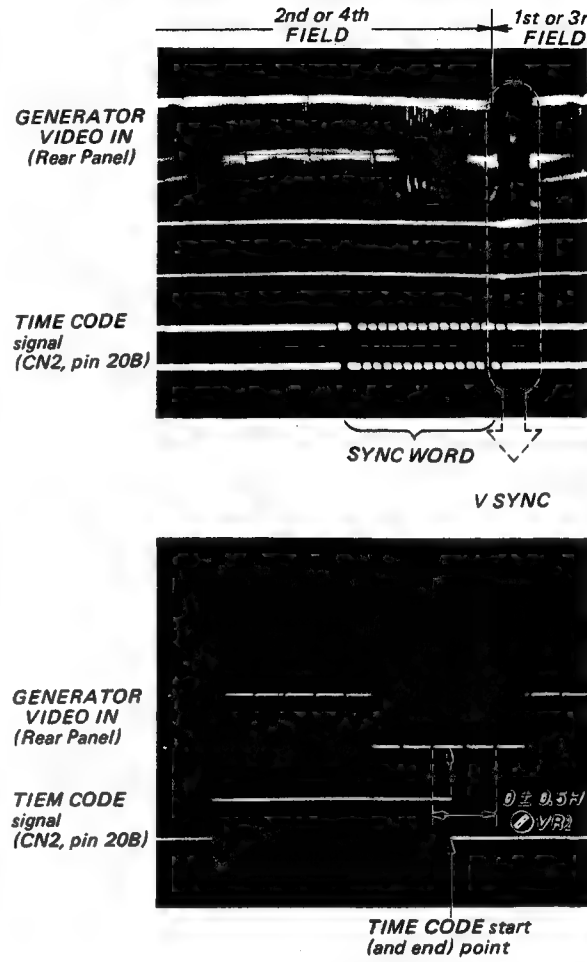
Preparation; Front Panel
SOURCE SELECT switch: REF
REF select switch: VIDEO
GENERATOR board
P. SET/NORMAL switch: P. SET
Same as Sec. 4-3-1, except Front Panel and GENERATOR board setting as shown above.

Equipment; Oscilloscope
CHOP mode
EXT TRIG: CN2, pin 18A/GENERATOR board
(–) slope

Spec. and Adj.;

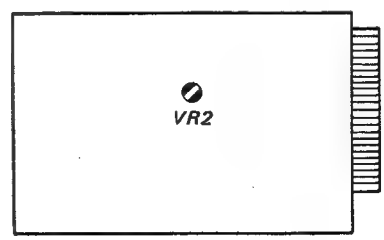
Step 1. Operate the HOLD switch to hold the display.
Operate the RESET switch to reset display to zero and the display should be kept in this state of hold until this adjustment is completed.

Step 2. GENERATOR board
⊘ VR2



Step 3. After adjustment, set the P. SET/NORMAL switch to NORMAL.

GENERATOR board



4-4. VIDEO BOARD ADJUSTMENT

4-4-1. Preparation for VIDEO Board Adjustment

VIDEO board

NTSC/PAL/SECAM switch:	PAL or SECAM
BLK/NORMAL switch:	NORMAL
DIM/NORMAL switch:	NORMAL
MEMORY/NORMAL switch:	NORMAL

4-4-2. Regarding the use of the Extension Board

Use of the Extension board is not recommended while the VIDEO board adjustment is attempted because the increased cross-talk makes adjustment difficult such that the VITC signal read-out becomes difficult.

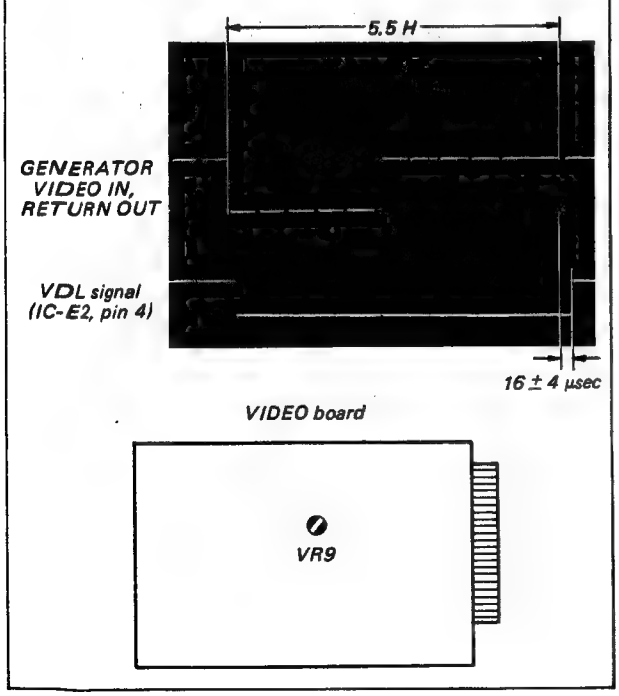
4-4-3. VDL Signal Timing Adjustment

Serial No. 10,001 to 10,040; USA/CND

Preparation; GENERATOR VIDEO IN
PAL or SECAM signal (75 Ω : OFF)
GENERATOR VIDEO IN, RETURN OUT
Connect 75 Ω termination plug.
Front Panel
REF select switch: VIDEO
Same as Sec. 4-4-1, except connection and Front Panel setting as shown above.

Equipment; Oscilloscope
CHOP mode
EXT TRIG: IC-E2, pin 4/VIDEO board

Spec. and Adj.; VIDEO board
⊘ VR9

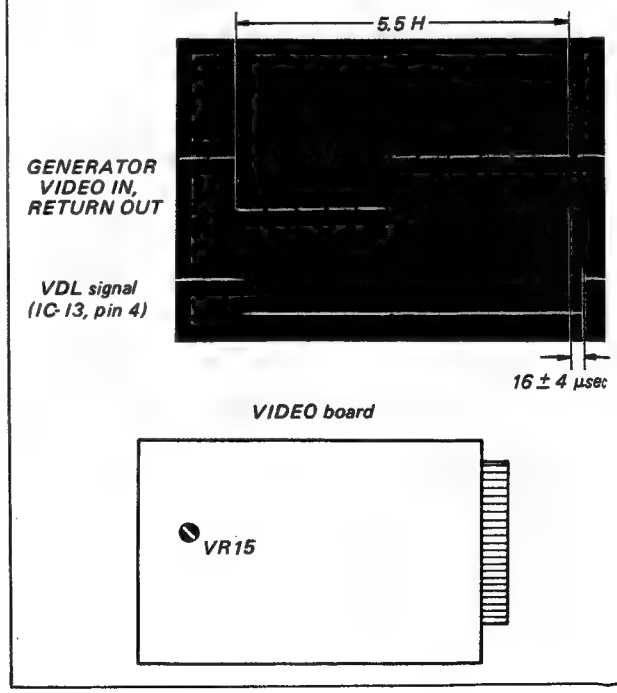


Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

Preparation; GENERATOR VIDEO IN
PAL or SECAM signal (75 Ω: OFF)
GENERATOR VIDEO IN, RETURN OUT
Connect 75 Ω termination plug.
Front Panel
REF select switch: VIDEO
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

Equipment; Oscilloscope
CHOP mode
EXT TRIG: IC-13, pin 4/VIDEO board

Spec. and Adj.; VIDEO board
⊘ VR15

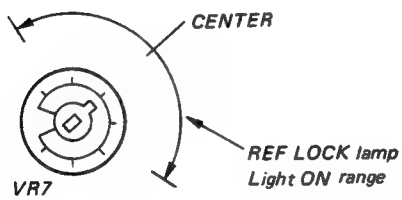


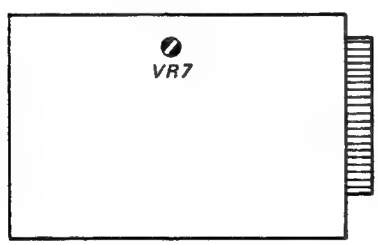
4-4-4. FRAME Signal Detector Adjustment

Serial No. 10,001 to 10,040; USA/CND

Preparation; GENERATOR VIDEO IN
PAL or SECAM signal (75 Ω: ON)
Front Panel
SOURCE SELECT switch: REF
REF select switch: VIDEO
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

Spec. and Adj.; VIDEO board
⊘VR7
Turn the VR7 ↷ clock and ↶ counter-clockwise. Stop VR7 in the center of the Front Panel REF. LOCK lamp Light ON range. Turn VR7 very slowly because the lamp takes about 10 seconds to light (LOCK state) once after the lamp is turned OFF (LOCK is lost.)

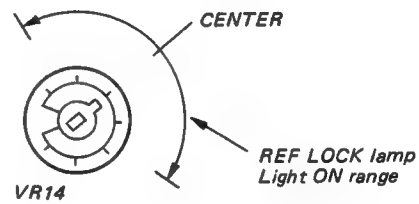


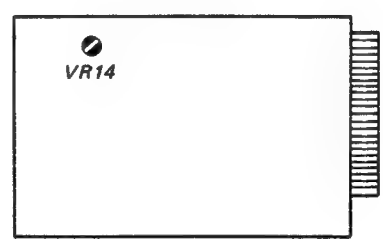


Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

Preparation; GENERATOR VIDEO IN
PAL or SECAM signal (75 Ω: ON)
Front Panel
SOURCE SELECT switch: REF
REF select switch; VIDEO
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

Spec. and Adj.; VIDEO board
⊘VR14
Turn the VR14 ↷ clock and ↶ counter-clockwise. Stop VR14 in the center of the Front Panel REF. LOCK lamp Light ON range. Turn VR14 very slowly because the lamp takes about 10 seconds to light (LOCK state) once after the lamp is turned OFF (LOCK is lost.)

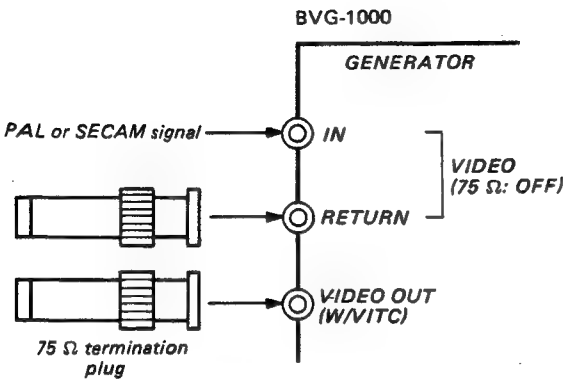




4-4-5. Video Output Level (GENERATOR) Adjustment

Serial No. 10,001 to 10,040; USA/CND

Preparation; Connection:



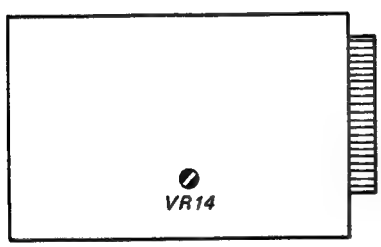
Same as Sec. 4-4-1, except Connection as shown above.

Equipment; Oscilloscope
Spec. and Adj.; VIDEO board
⊘ VR14

VIDEO OUT signal amplitude = VIDEO IN (at RETURN) signal amplitude

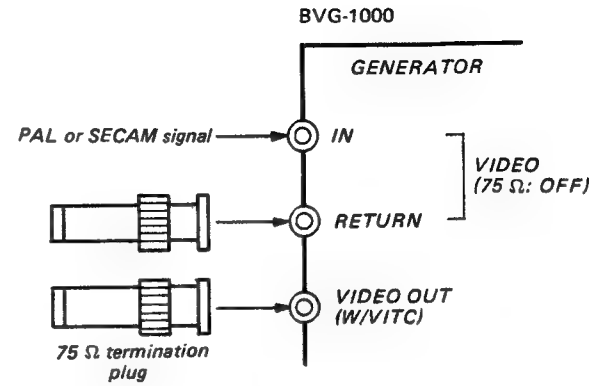
difference of amplitude = 0 ± 0.035 V (±5 IRE)

VIDEO board



Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

Preparation; Connection:



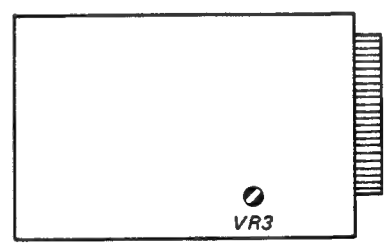
Same as Sec. 4-4-1, except Connection as shown above.

Equipment; Oscilloscope
Spec. and Adj.; VIDEO board
⊘ VR3

VIDEO OUT signal amplitude = VIDEO IN (at RETURN) signal amplitude

difference of amplitude = 0 ± 0.035 V (±5 IRE)

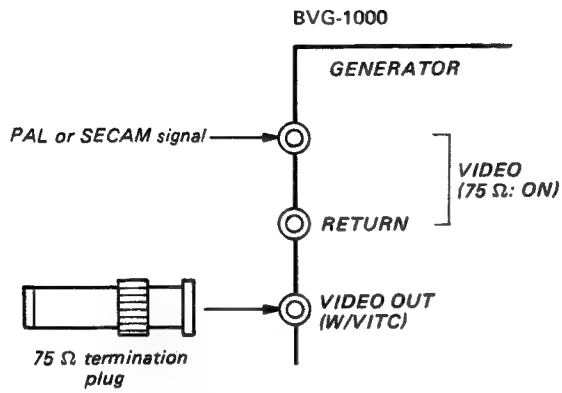
VIDEO board



4-4-6. VITC Insertion Portion Pedestal Level (GENERATOR) Adjustment

Serial No. 10,001 to 10,040; USA/CND

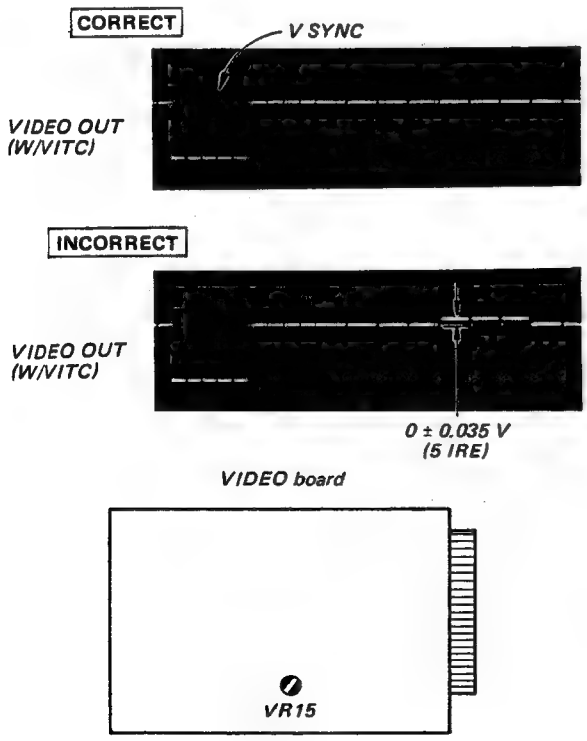
Preparation; Connection:



Front Panel
REF select switch: VIDEO
VITC ON/OFF switch: OFF
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

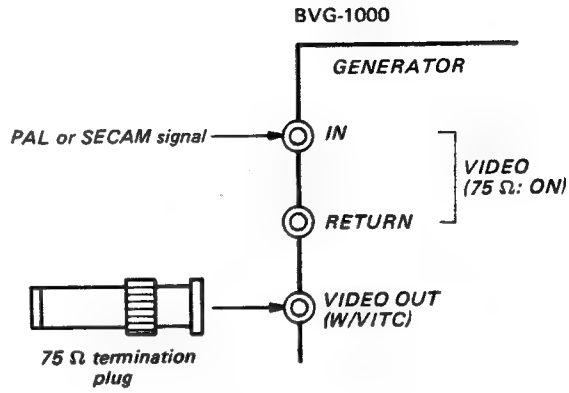
Equipment; Oscilloscope
EXT TRIG: IC-B2, pin 6/VIDEO board

Spec. and Adj.; VIDEO board
VR15



Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

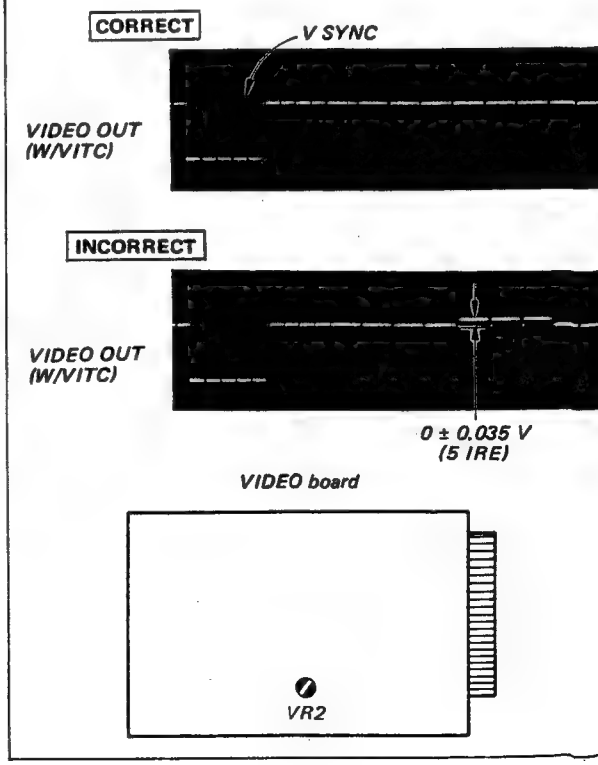
Preparation; Connection:



Front Panel
REF select switch: VIDEO
VITC ON/OFF switch: OFF
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

Equipment; Oscilloscope
EXT TRIG: IC-A2, pin 6/VIDEO board

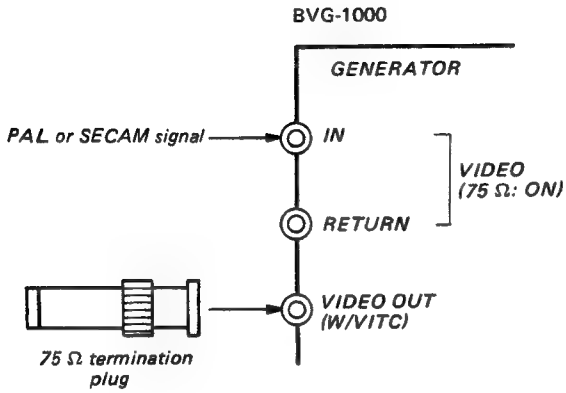
Spec. and Adj.; VIDEO board
VR2



4-4-7. VITC Output Level (GENERATOR) Adjustment

Serial No. 10,001 to 10,040; USA/CND

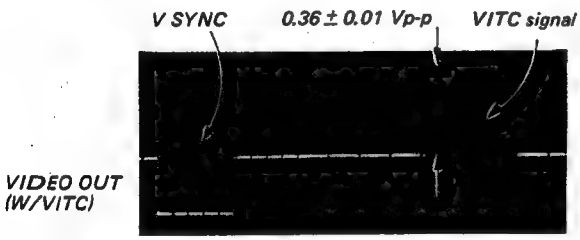
Preparation; Connection:

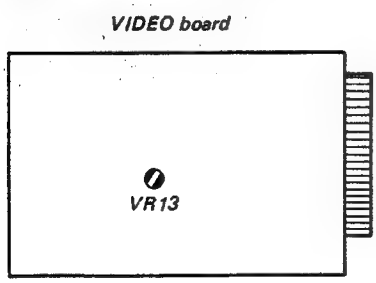


Front Panel
REF select switch: VIDEO
VITC ON/OFF switch: ON
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

Equipment; Oscilloscope
EXT TRIG: IC-B2, pin 6/VIDEO board

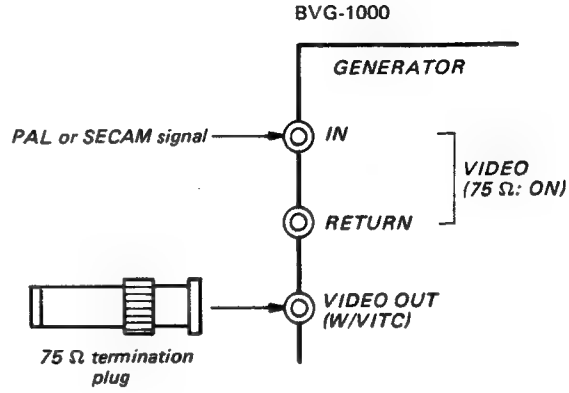
Spec. and Adj.; VIDEO board
◐ VR13





Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

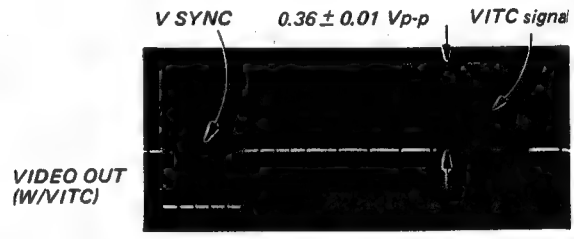
Preparation; Connection:

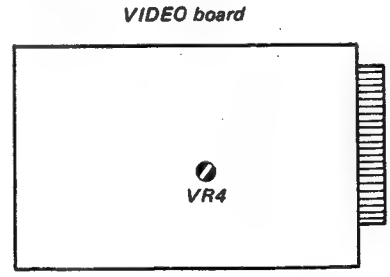


Front Panel
REF select switch: VIDEO
VITC ON/OFF switch: ON
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

Equipment; Oscilloscope
EXT TRIG: IC-A2, pin 6/VIDEO board

Spec. and Adj.; VIDEO board
◐ VR4

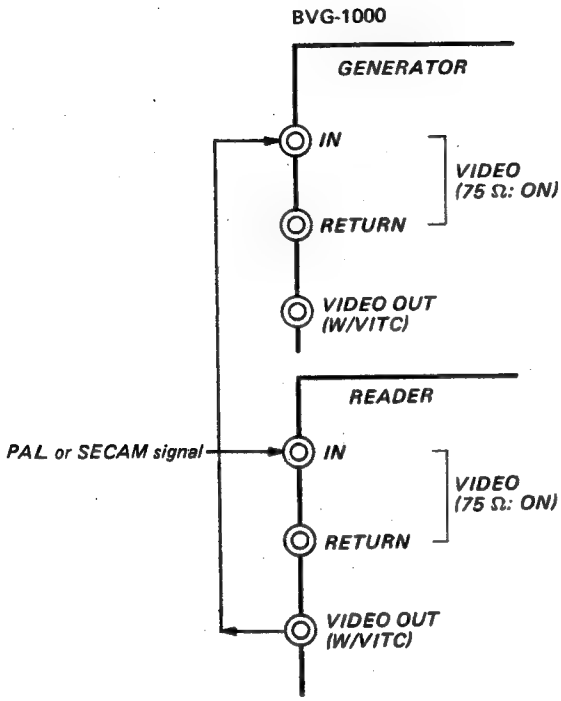




4-4-8. VITC Input Slice Level (GENERATOR) Adjustment

Serial No. 10,001 to 10,040; USA/CND

Preparation; Connection:



Front Panel
GENERATOR/READER switch; GENERATOR
SOURCE SELECT switch; EXT CODE
REF select switch; VIDEO
VITC THRU/ON/OFF switch; ON

Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

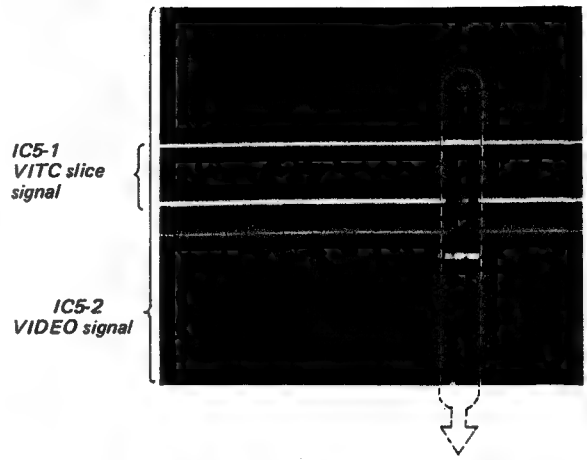
Equipment; Oscilloscope
ALT mode
INPUT: DC mode
EXT TRIG: IC-B2, pin 6/VIDEO board

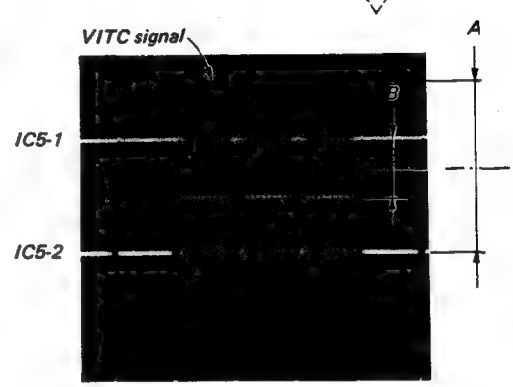
Spec. and Adj.;

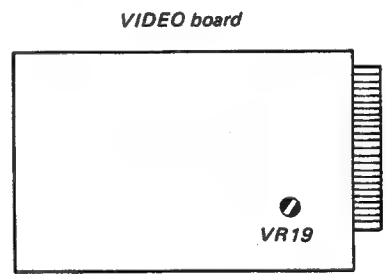
Step 1. Set the scope CH-1 and CH-2 VERT GAIN to 0.05 V/DIV.

Step 2. Set the scope INPUT of both CH-1 and CH-2 to GND mode and adjust the scope GND trace line to the bottom of scope scale.
Set then the both INPUT mode to the DC mode.

Step 3. VIDEO board
⊘VR19
Adjust so that the center of the VITC slice level "B" (IC5-1) and the center of the VITC signal level "A" (IC5-2) are on the same line on scope.

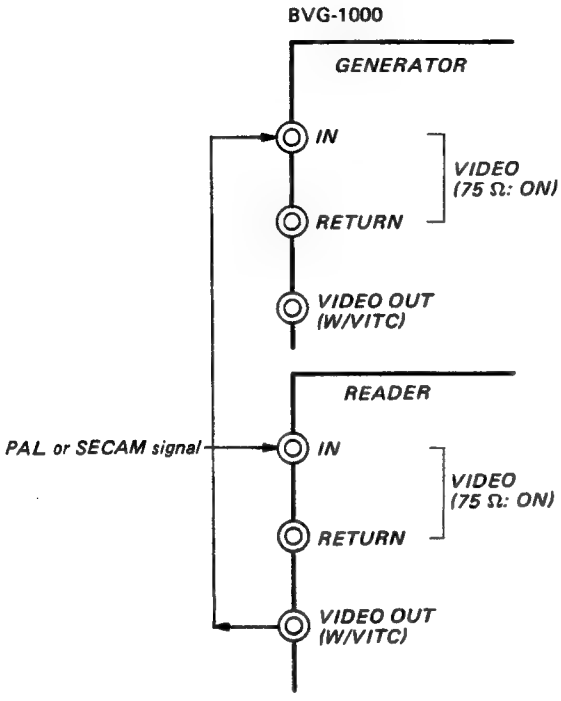






Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

Preparation; Connection:



Front Panel
GENERATOR/READER switch; GENERATOR
SOURCE SELECT switch; EXT CODE
REF select switch; VIDEO
VITC THRU/ON/OFF switch; ON

Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

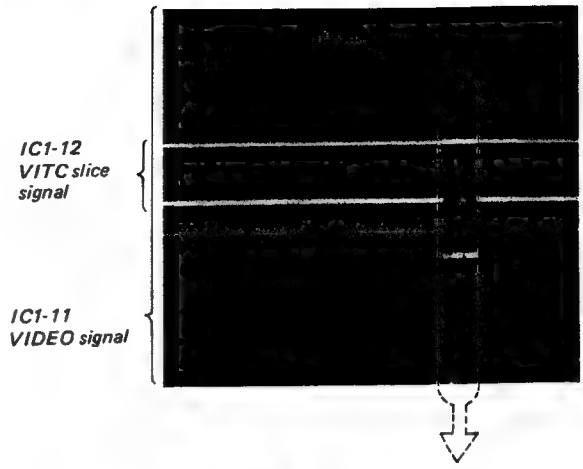
Equipment; Oscilloscope
ALT mode
INPUT: DC mode
EXT TRIG: IC-A2, pin 6/VIDEO board

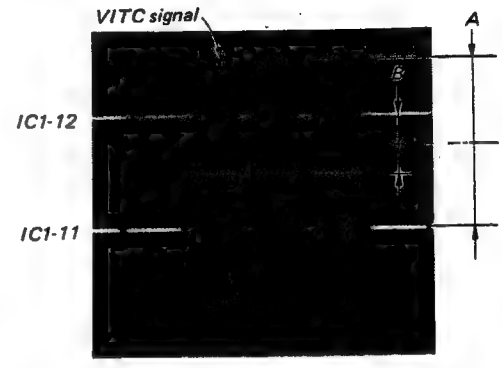
Spec. and Adj.;

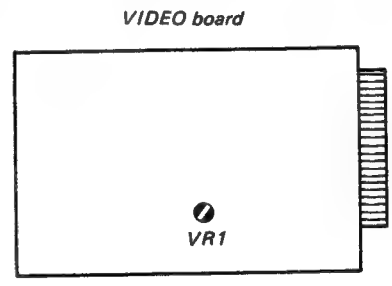
Step 1. Set the scope CH-1 and CH-2 VERT GAIN to 0.05 V/DIV.

Step 2. Set the scope INPUT of both CH-1 and CH-2 to GND mode and adjust the scope GND trace line to the bottom of scope scale.
Set then the both INPUT mode of the DC mode.

Step 3. VIDEO board
⊘VR1
Adjust so that the center of the VITC slice level "B" (IC1-12), and the center of the VITC signal level "A" (IC1-11) are on the same line on scope.



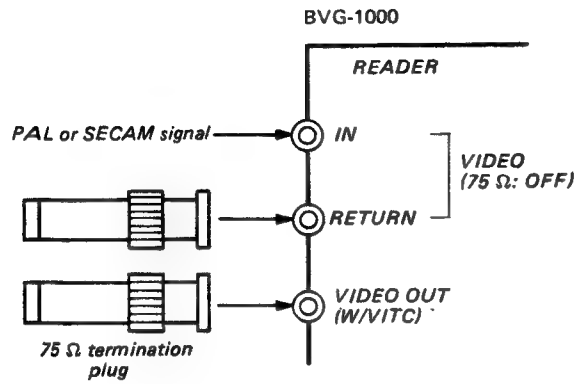




4-4-9. Video Output Level (READER; W/VITC) Adjustment

Serial No. 10,001 to 10,040; USA/CND

Preparation; Connection:

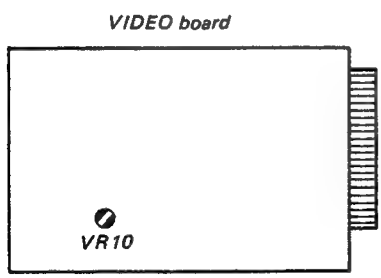


Same as Sec. 4-4-1, except Connection as shown above.

Equipment; Oscilloscope
Spec. and Adj.; VIDEO board
⊘ VR10

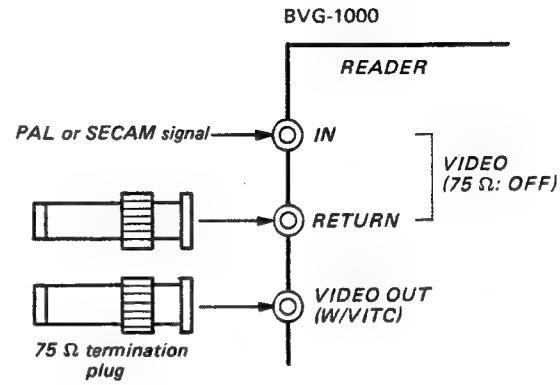
VIDEO OUT signal amplitude = VIDEO IN (at RETURN) signal amplitude

difference of amplitude = 0 ± 0.035 V (±5 IRE)



Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

Preparation; Connection:

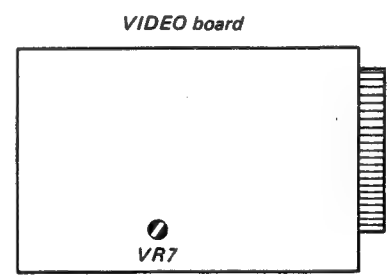


Same as Sec. 4-4-1, except Connection as shown above.

Equipment; Oscilloscope
Spec. and Adj.; VIDEO board
⊘ VR7

VIDEO OUT signal amplitude = VIDEO IN (at RETURN) signal amplitude

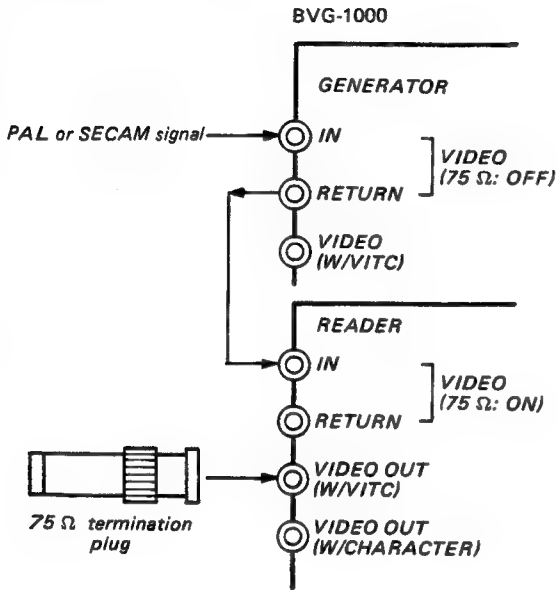
difference of amplitude = 0 ± 0.035 V (±5 IRE)



4-4-10. VITC Insertion Portion Pedestal Level (READER; W/VITC) Adjustment

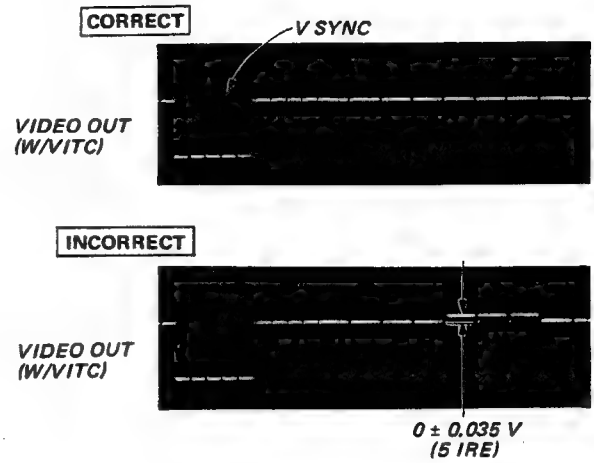
Serial No. 10,001 to 10,040; USA/CND

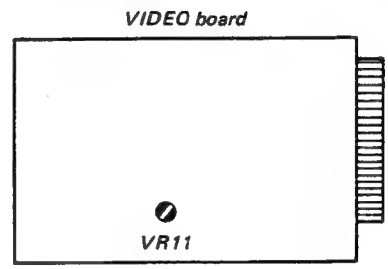
Preparation; Connection:



Front Panel
REF select switch: VIDEO
VITC THRU/ON/OFF switch: OFF
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

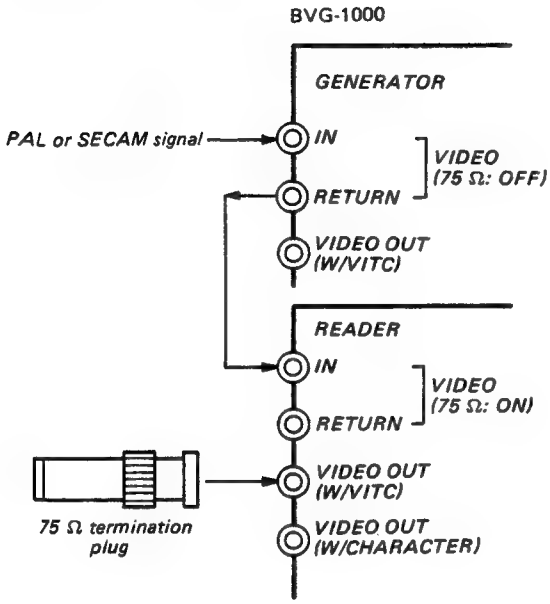
Equipment; Oscilloscope
EXT TRIG: IC-B2, pin 6/VIDEO board
Spec. and Adj.; VIDEO board
⊘VR11





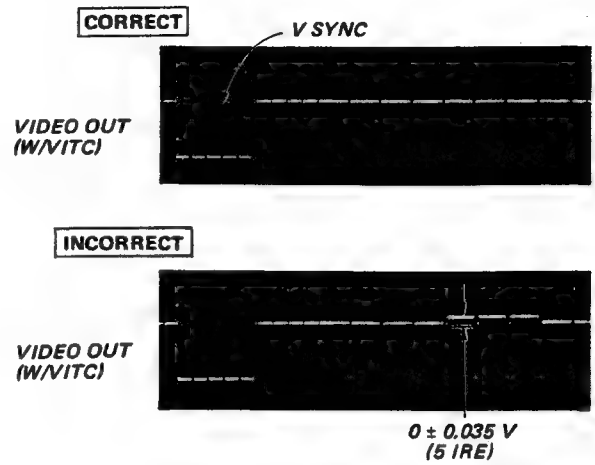
Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

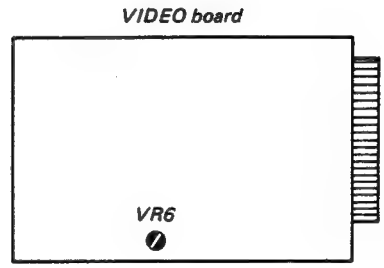
Preparation; Connection:



Front Panel
REF select switch: VIDEO
VITC THRU/ON/OFF switch: OFF
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

Equipment; Oscilloscope
EXT TRIG; IC-A2, pin 6/VIDEO board
Spec. and Adj.; VIDEO board
VR6

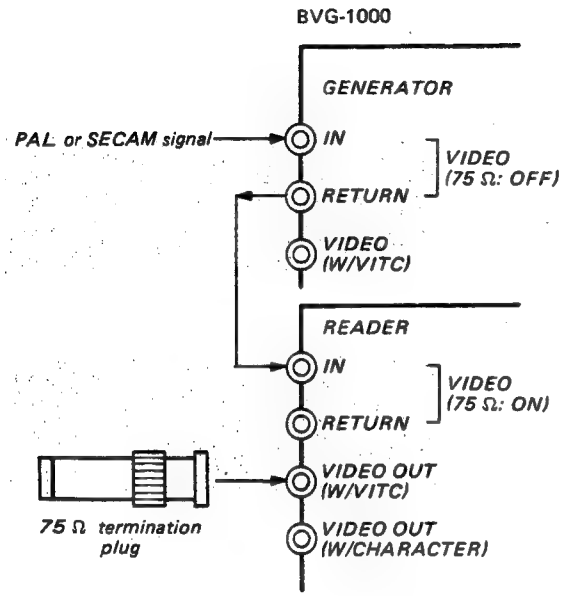




4-4-11. VITC Output Level (READER; W/VITC) Adjustment

Serial No. 10,001 to 10,040; USA/CND

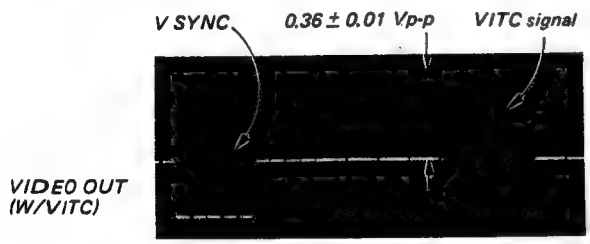
Preparation; Connection:

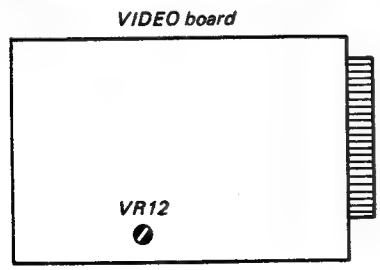


Front Panel
REF select switch: VIDEO
VITC THRU/ON/OFF switch: ON
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

Equipment; Oscilloscope
EXT TRIG: IC-B2, pin 6/VIDEO board

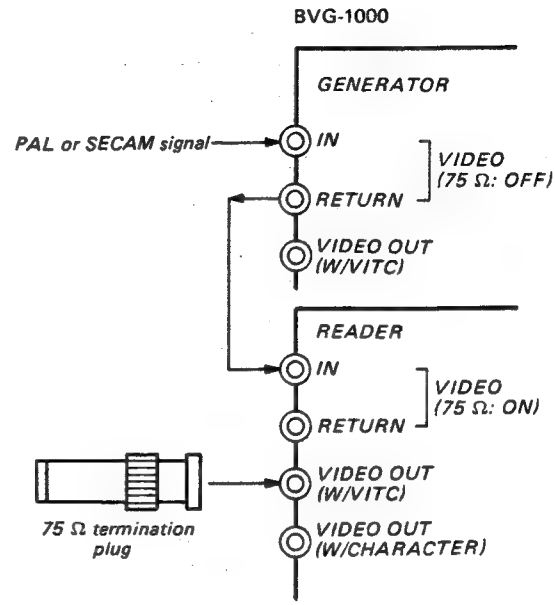
Spec. and Adj.; VIDEO board
⊘VR12





Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

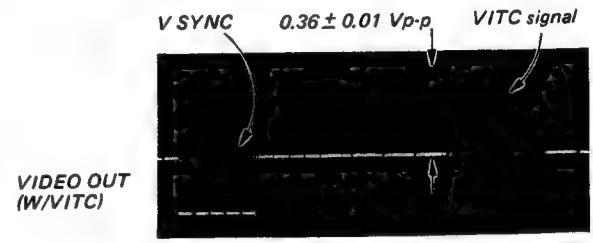
Preparation; Connection:

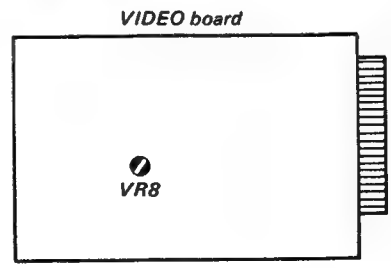


Front Panel
REF select switch: VIDEO
VITC THRU/ON/OFF switch: ON
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

Equipment; Oscilloscope
EXT TRIG: IC-A2, pin 6/VIDEO board

Spec. and Adj.; VIDEO board
⊘ VR8

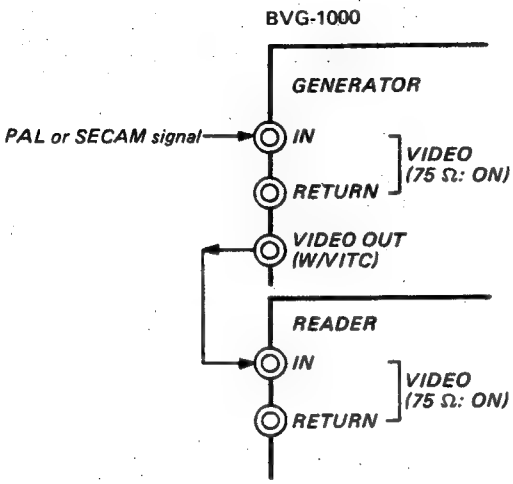




4-4-12. VITC Input Slice Level (READER) Adjustment

Serial No. 10,001 to 10,040; USA/CND

Preparation; Connection:



Front Panel
GENERATOR/READER switch: GENERATOR
SOURCE SELECT switch: REF
REF select switch: VIDEO
VITC ON/OFF switch: ON
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

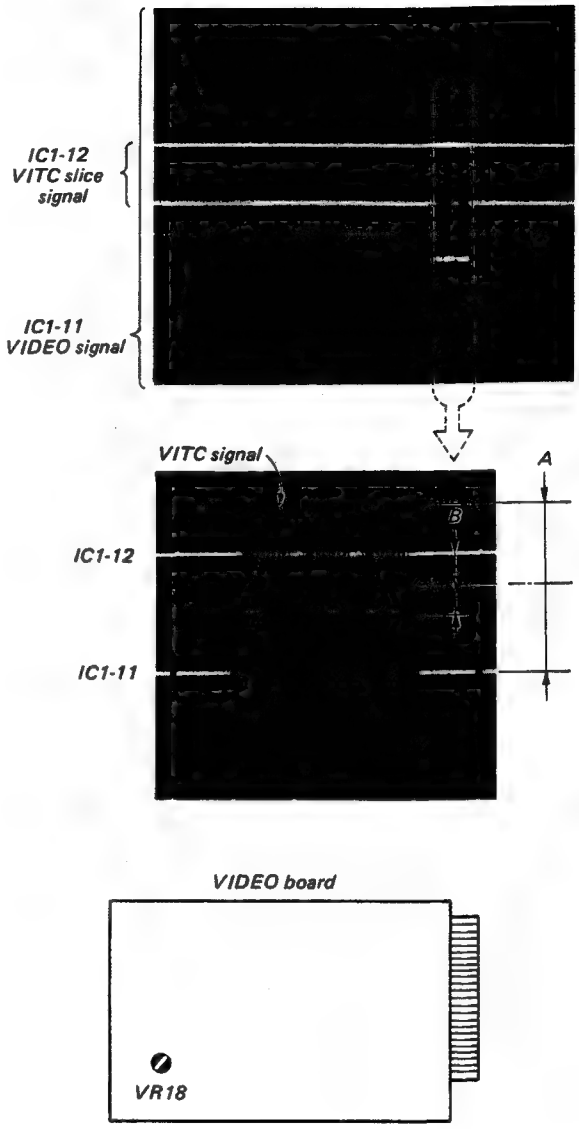
Equipment; Oscilloscope
ALT mode
INPUT: DC mode
EXT TRIG: IC-B2, pin 6/VIDEO board

Spec. and Adj.;

Step 1. Set the scope CH-1 and CH-2 VERT GAIN to 0.05 V/DIV.

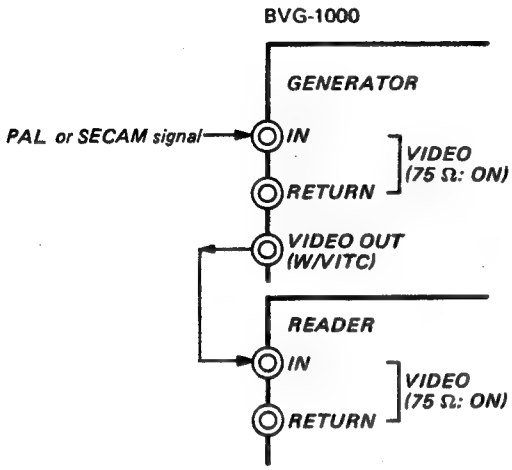
Step 2. Set the scope INPUT of both CH-1 and CH-2 to GND mode and adjust the scope GND trace line to the bottom of scope scale.
Set then the both INPUT mode to the DC mode.

Step 3. VIDEO board
⊘VR18
Adjust so that the center of the VITC slice level "B" (IC1-12), and the center of the VITC signal level "A" (IC1-11) are on the same line on scope.



Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

Preparation; Connection:



Front Panel
GENERTOR/READER switch: GENERATOR
SOURCE SELECT switch: REF
REF select switch: VIDEO
VITC ON/OFF switch: ON

Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

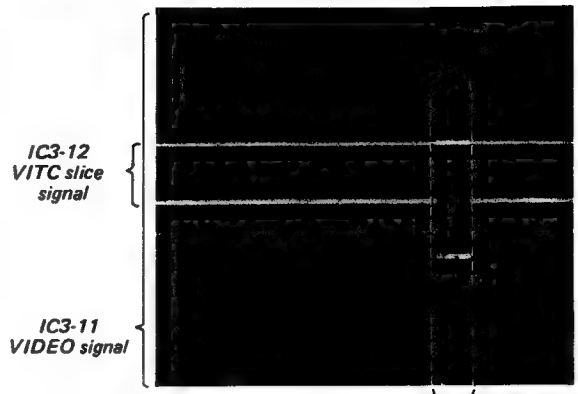
Equipment; Oscilloscope
ALT mode
INPUT: DC mode
EXT TRIG: IC-A2, pin 6/VIDEO board

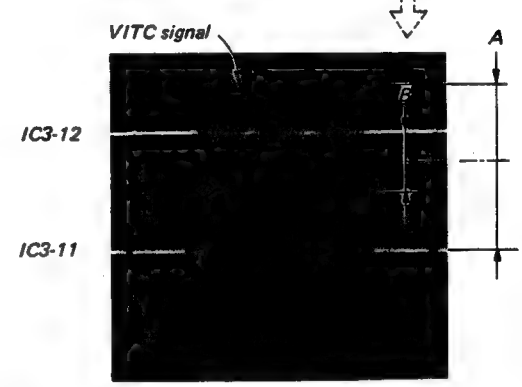
Spec. and Adj.;

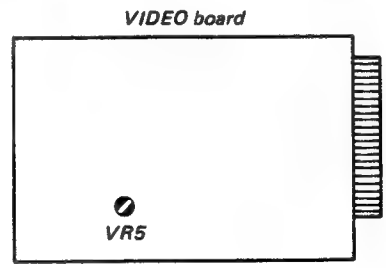
Step 1. Set the scope CH-1 and CH-2 VERT GAIN to 0.05 V/DIV.

Step 2. Set the scope INPUT of both CH-1 and CH-2 to GND mode and adjust the scope GND trace line to the bottom of scope scale.
Set then the both INPUT mode of the DC mode.

Step 3. VIDEO board
⊘ VR5
Adjust so that the center of the VITC slice level "B" (IC3-12), and the center of the VITC signal level "A" (IC3-11) are on the same line on scope.



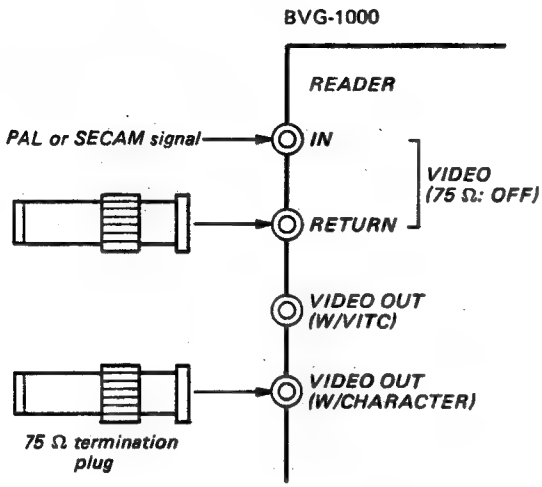




4-4-13. Video Output Level (READER; W/CHARACTER) Adjustment

Serial No. 10,001 to 10,040; USA/CND

Preparation; Connection:



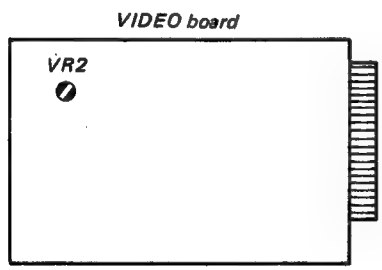
Same as Sec. 4-4-1, except Connection as shown above.

Equipment; Oscilloscope

Spec. and Adj.; VIDEO board
VR2

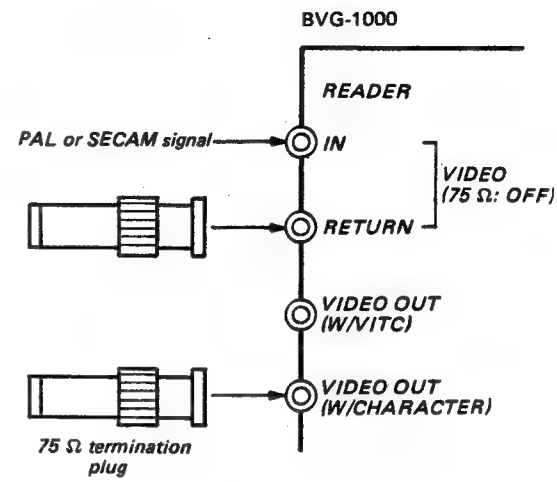
VIDEO OUT signal amplitude = VIDEO IN (at RETURN) signal amplitude

difference of amplitude = 0 ± 0.035 V (±5 IRE)



Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

Preparation; Connection:



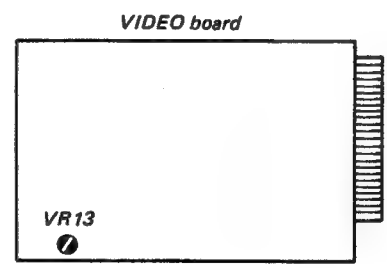
Same as Sec. 4-4-1, except Connection as shown above.

Equipment; Oscilloscope

Spec. and Adj.; VIDEO board
VR13

VIDEO OUT signal amplitude = VIDEO IN (at RETURN) signal amplitude

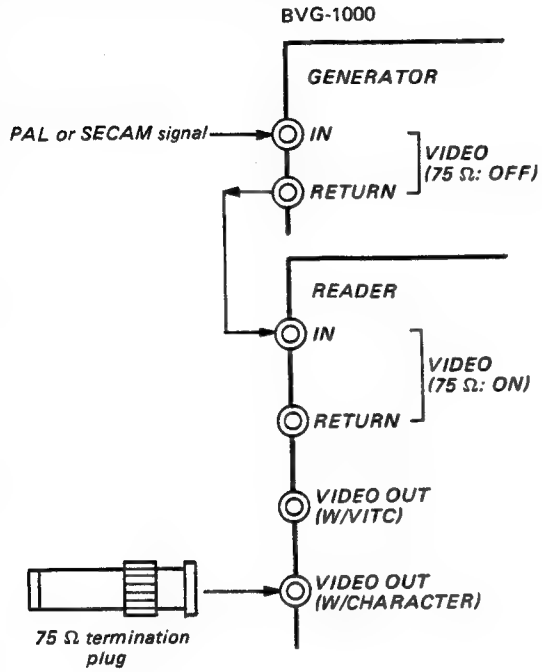
difference of amplitude = 0 ± 0.035 V (±5 IRE)



4-4-14. VITC Insertion Portion Pedestal Level (READER; W/CHARACTER) Adjustment

Serial No. 10,001 to 10,040; USA/CND

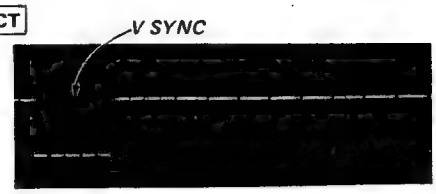
Preparation; Connection:



Front Panel
REF select switch: VIDEO
VITC THRU/ON/OFF switch: OFF
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

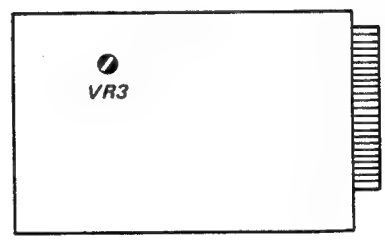
Equipment; Oscilloscope
EXT TRIG: IC-B2,pin 6/VIDEO board
Spec. and Adj.; VIDEO board
VR3

CORRECT



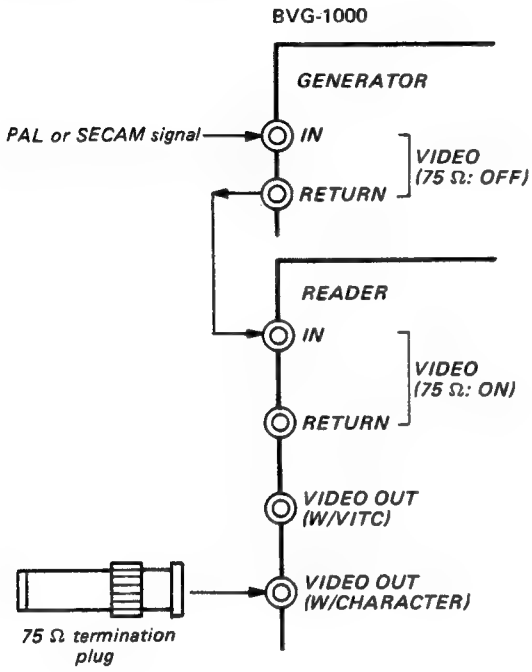
INCORRECT

0 ± 0.035 V
(5 IRE)



Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

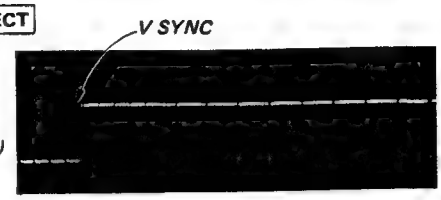
Preparation; Connection:



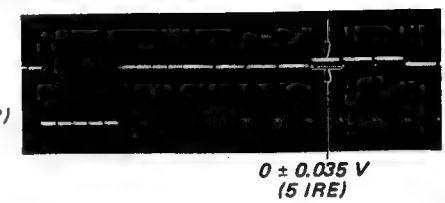
Front Panel
REF select switch; VIDEO
VITC THRU/ON/OFF switch; OFF
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

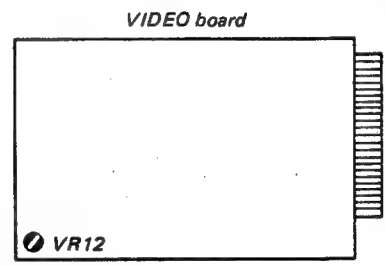
Equipment; Oscilloscope
EXT TRIG: IC-A2, pin 6/VIDEO board
Spec. and Adj.; VIDEO board
VR12

CORRECT



INCORRECT



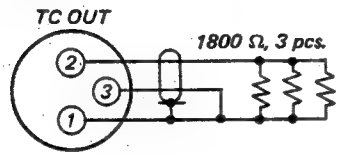


4-4-15. TIME CODE Output Level (GENERATOR) Adjustment

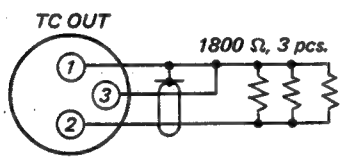
Serial No. 10,001 to 10,040; USA/CND

Preparation; Connection
Terminate the GENERATOR TC OUT with 600 Ω unbalanced as shown.
(Use three pieces of 1800 Ω resistor.)

USA/CND/AEP

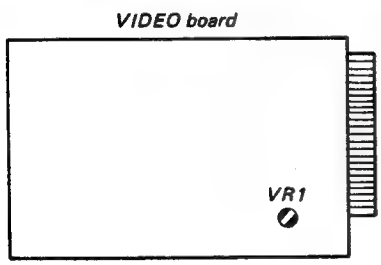


JAPAN



Same as Sec. 4-4-1, except Connection as shown above.

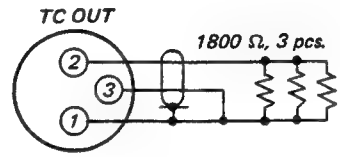
Equipment; Oscilloscope
Spec. and Adj.; VIDEO board
⊘ VR1



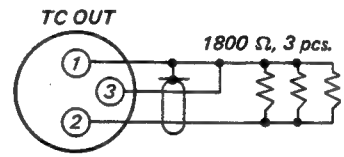
Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

Preparation; Connection
Terminate the GENERATOR TC OUT with 600 Ω unbalanced as shown.
(Use three pieces of 1800 Ω resistor.)

USA/CND/AEP

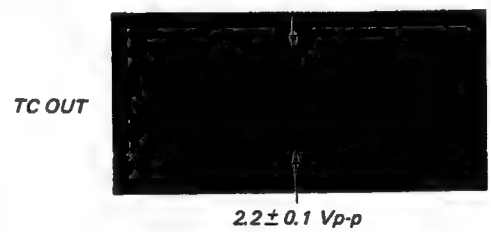


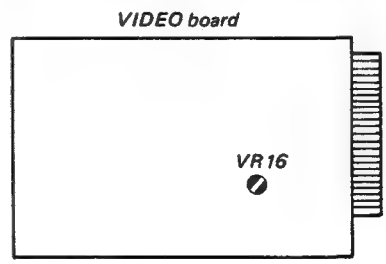
JAPAN



Same as Sec. 4-4-1, except Connection as shown above.

Equipment; Oscilloscope
Spec. and Adj.; VIDEO board
⊘ VR16



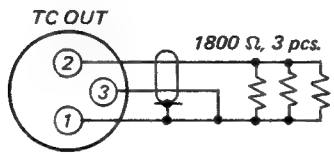


4-4-16. TIME CODE Output Level (READER) Adjustment

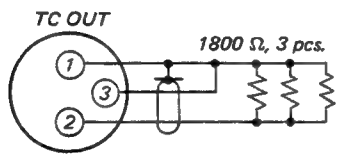
Serial No. 10,001 to 10,040; USA/CND

Preparation; Connection
Terminate the READER TO OUT with 600 Ω unbalanced as shown. (Use three pieces of 1800 Ω resistor.)

USA/CND/AEP

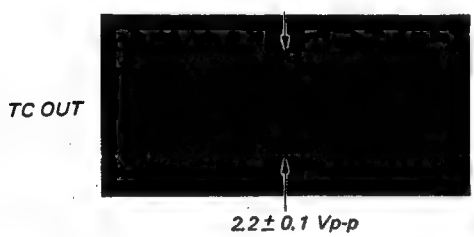


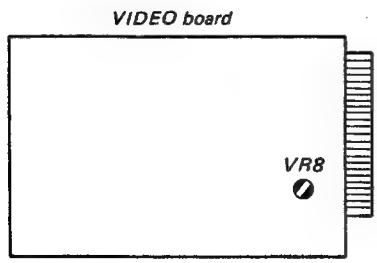
JAPAN



READER board
THRU/NORMAL switch: NORMAL
Same as Sec. 4-4-1, except Connection and READER board setting as shown above.

Equipment; Oscilloscope
Spec. and Adj.; VIDEO board
⊘ VR8

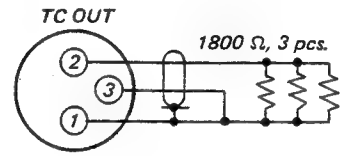




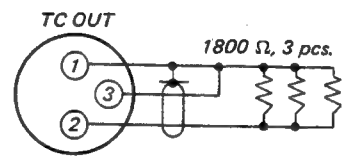
Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

Preparation; Connection
Terminate the READER TC OUT with 600 Ω unbalanced as shown. (Use three pieces of 1800 Ω resistor.)

USA/CND/AEP

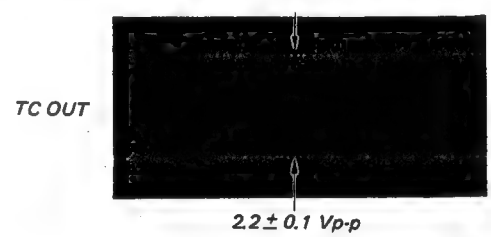


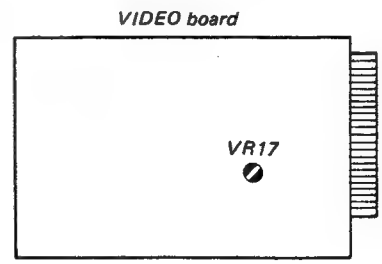
JAPAN



READER board
THRU/NORMAL switch: NORMAL
Same as Sec. 4-4-1, except Connection and READER board setting as shown above.

Equipment; Oscilloscope
Spec. and Adj.; VIDEO board
⊘ VR17

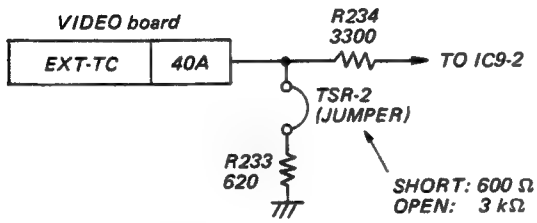




4-4-17. TIME CODE Input Slice Level (GENERATOR) Adjustment

Serial No. 10,001 to 10,040; USA/CND

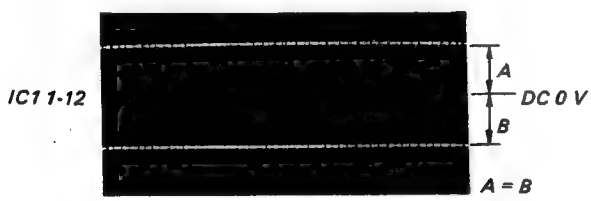
Preparation; Connection
Supplied the GENERATOR TC OUT to the GENERATOR TC IN.
Front Panel
GENERATOR/READER switch: GENERATOR
SOURCE SELECT switch: EXT CODE
VIDEO board
Set the TC IN input impedance to 600 Ω.
Impedance of the TC IN can be selected to either 600 Ω or 3 kΩ by a jumper (TSR-2) on the VIDEO board.



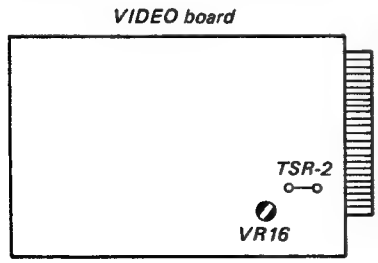
The TSR-2 should be shorted by a jumper to obtain 600Ω input impedance.
Same as Sec. 4-4-1, except Connection, Front Panel and VIDEO board setting as shown above.

Equipment; Oscilloscope
INPUT mode: DC

Spec. and Adj.; VIDEO board
⊘ VR16

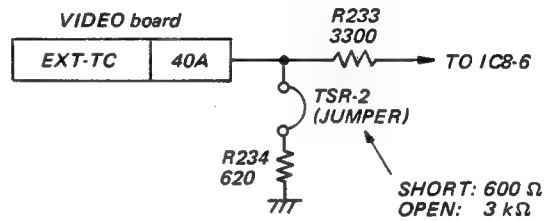


After adjustment, reset the TSR-2 (jumper) to the original state of starting the adjustment.



Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

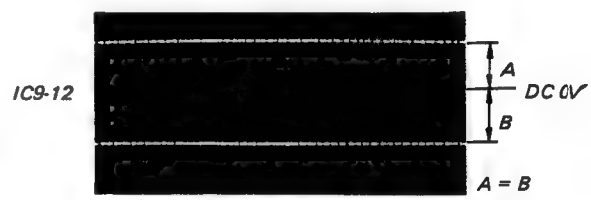
Preparation; Connection
Supplied the GENERATOR TC OUT to the GENERATOR TC IN.
Front Panel
GENERATOR/READER switch: GENERATOR
SOURCE SELECT switch: EXT CODE
VIDEO board
Set the TC IN input impedance to 600 Ω.
Impedance of the TC IN can be selected to either 600 Ω or 3 kΩ by a jumper (TSR-2) on the VIDEO board.



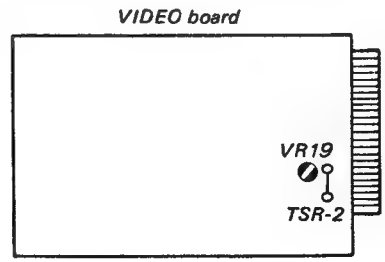
The TSR-2 should be shorted by a jumper to obtain 600Ω input impedance.
Same as Sec. 4-4-1, except Connection, Front Panel and VIDEO board setting as shown above.

Equipment; Oscilloscope
INPUT mode: DC

Spec. and Adj.; VIDEO board
⊘ VR19



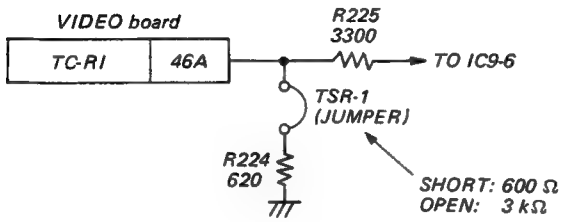
After adjustment, reset the TSR-2 (jumper) to the original state of starting the adjustment.



4-4-18. TIME CODE Input Slice Level (READER) Adjustment

Serial No. 10,001 to 10,040; USA/CND

Preparation; Connection
Supplied the GENERATOR TC OUT to the READER TC IN.
Front Panel
SOURCE SELECT switch: REF
VIDEO board
Set the TC IN input impedance to 600 Ω.
Impedance of the TC IN can be selected to either 600 Ω or 3 kΩ by a jumper (TSR-1) on the VIDEO board.



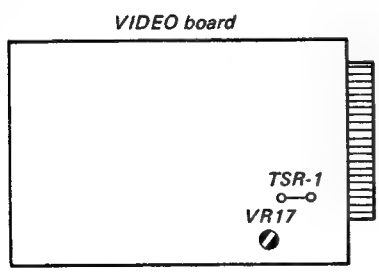
The TSR-1 should be shorted by a jumper to obtain 600Ω input impedance.

Same as Sec. 4-4-1, except Connection, Front Panel and VIDEO board setting as shown above.

Equipment; Oscilloscope
INPUT mode: DC

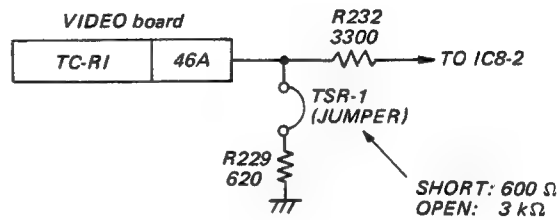
Spec. and Adj.; VIDEO board
VR17

After adjustment, reset the TSR-1 (jumper) to the original state of starting the adjustment.



Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

Preparation; Connection
Supplied the GENERATOR TC OUT to the READER TC IN.
Front Panel
SOURCE SELECT switch: REF
VIDEO board
Set the TC IN input impedance to 600 Ω.
Impedance of the TC IN can be selected to either 600 Ω or 3 kΩ by a jumper (TSR-1) on the VIDEO board.



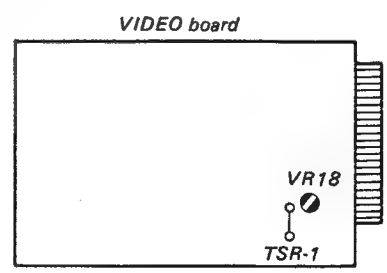
The TSR-1 should be shorted by a jumper to obtain 600Ω input impedance.

Same as Sec. 4-4-1, except Connection, Front Panel and VIDEO board setting as shown above.

Equipment; Oscilloscope
INPUT mode: DC

Spec. and Adj.; VIDEO board
VR18

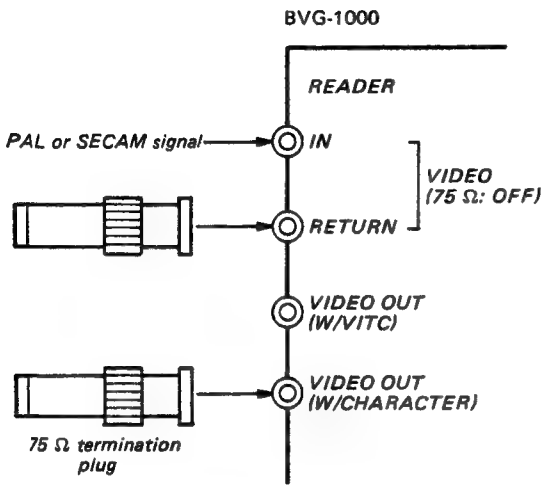
After adjustment, reset the TSR-1 (jumper) to the original state of starting the adjustment.



4-4-19. SECAM Mode Carrier Frequency Adjustment

Serial No. 10,001 to 10,040; USA/CND

Preparation; Connection:

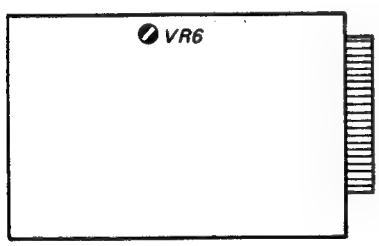


VIDEO board
NTSC/PAL/SECAM switch: SECAM
BLK/NORMAL switch: BLK
Front Panel
CHARACTER switch: ON
Same as Sec. 4-4-1, except Connection as shown above.

Equipment; Frequency counter
Spec, and Adj.; VIDEO board
⊘VR6

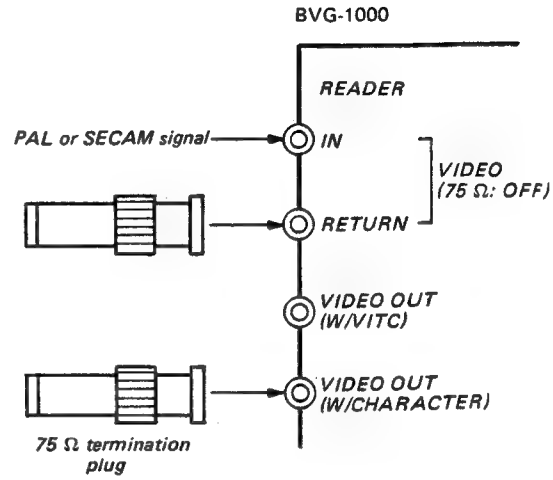
IC-J1, Pin 8 = 4.4 MHz ± 200 kHz

VIDEO board



Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

Preparation; Connection:



VIDEO board
NTSC/PAL/SECAM switch: SECAM
BLK/NORMAL switch: BLK
Front Panel
CHARACTER switch: ON
Same as Sec. 4-4-1, except connection as shown above.

Equipment; Frequency counter
Spec. and Adj.; VIDEO board
⊘VR10

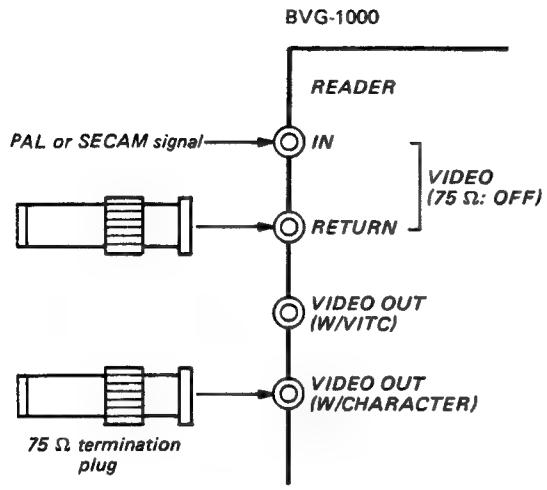
IC-K1 Pin 8 = 4.4 MHz ± 200 kHz

VIDEO board

4-4-20. Black Burst Pedestal Carrier Level Adjustment

Serial No. 10,001 to 10,040; USA/CND

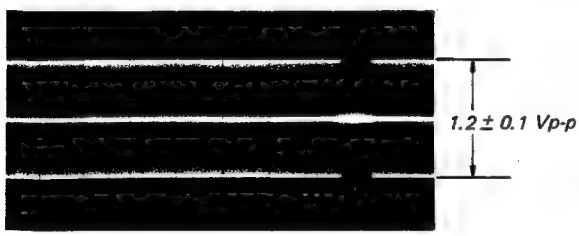
Preparation; Connection:

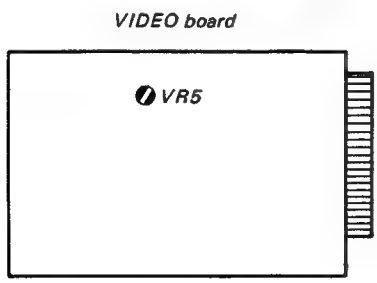


VIDEO board
NTSC/PAL/SECAM switch: SECAM
BLK/NORMAL switch: BLK
Front Panel
CHARACTER switch: ON
Same as Sec. 4-4-1, except Connection as shown above.

Equipment; Oscilloscope
Spec. and Adj.; VIDEO board
⊘ VR5

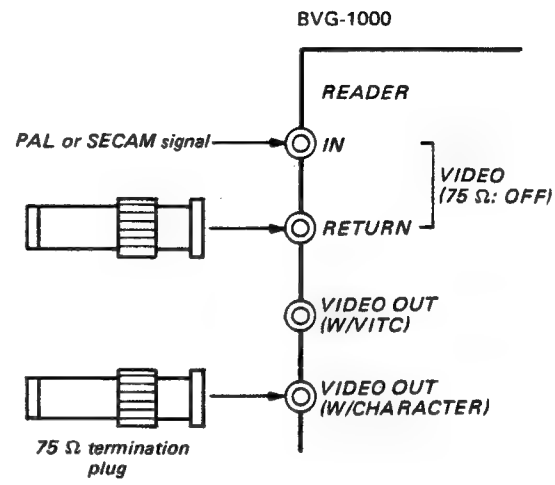
Transistor Q15 Pin 1 = 1.2 ± 0.1 Vp-p





Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

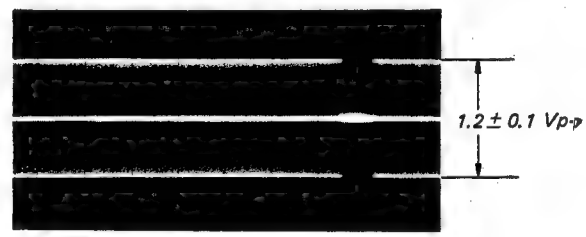
Preparation; Connection:

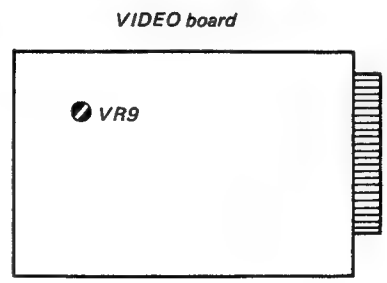


VIDEO board
NTSC/PAL/SECAM switch: SECAM
BLK/NORMAL switch: BLK
Front Panel
CHARACTER switch: ON
Same as Sec. 4-4-1, except Connection as shown above.

Equipment; Oscilloscope
Spec. and Adj.; VIDEO board
⊘ VR9

Transistor Q19 Pin 1 = 1.2 ± 0.1 Vp-p

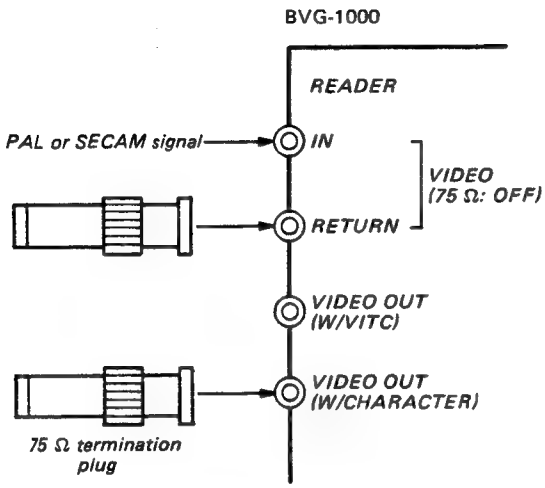




4-4-21. Character Carrier Level Adjustment

Serial No. 10,001 to 10,040; USA/CND

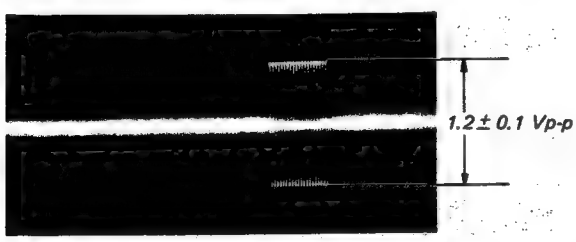
Preparation; Connection:

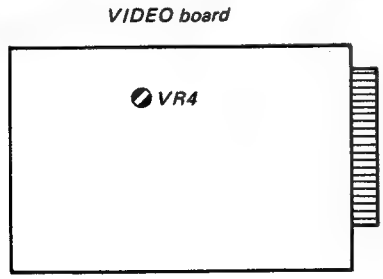


VIDEO board
NTSC/PAL/SECAM switch: SECAM
BLK/NORMAL switch: BLK
Front Panel
CHARACTER switch: ON
Same as Sec. 4-4-1, except Connection as shown above.

Equipment; Oscilloscope
Spec. and Adj.; VIDEO board
⊘VR4

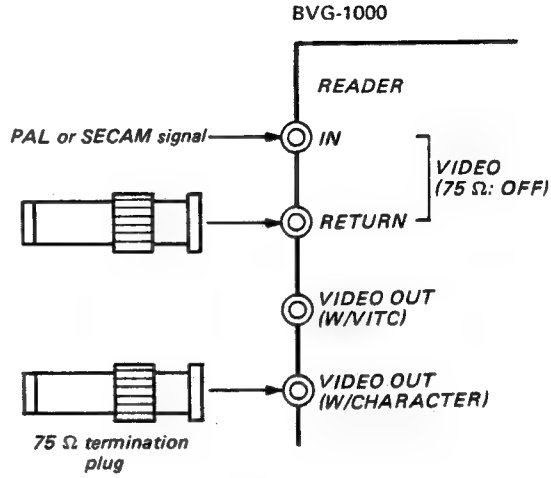
Transistor Q15 Pin 6 = 1.2 ± 0.1 Vp-p





Serial No. 10,041 and higher; USA/CND
Serial No. 10,001 and higher; AEP

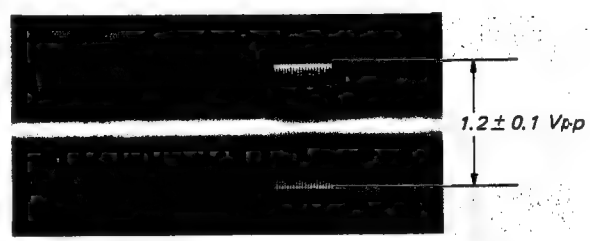
Preparation; Connection:

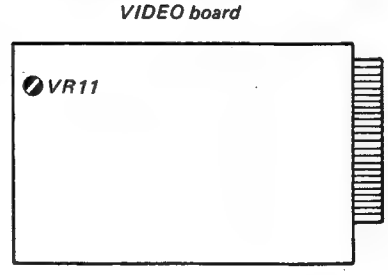


VIDEO board
NTSC/PAL/SECAM switch: SECAM
BLK/NORMAL switch: BLK
Front Panel
CHARACTER switch: ON
Same as Sec. 4-4-1, except Connection as shown above.

Equipment; Oscilloscope
Spec. and Adj.; VIDEO board
⊘VR11

Transistor Q19 Pin 6 = 1.2 ± 0.1 Vp-p





SECTION 5
SPARE PARTS

5-1. PARTS INFORMATION

1. **Safety Related Component Warning**

   Components identified by shading on the schematic diagrams, exploded views and electrical spare parts list are critical to safe operation. Replace these components with Sony parts whose part numbers appear as shown in this manual or in service bulletins and service manual supplements published by Sony.

2. Replace Parts that are supplied from Sony Parts Center can sometimes have different shape and external appearance than what are actually used in equipment. This is due to **"standardization of genuine parts"**.

   - This manul's exploded views and electrical spare parts lists are indicating the parts numbers of "the standardized genuine parts at present".

3. **Printed Components in Bold-Face type** on the exploded views and electrical spare parts list are normally stocked for replacement purposes. The remaining parts are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.

4. Item with no part number and/or no description are not stocked because they are seldom required for routine service.

5. (T) after a spring description is shown on the exploded views in order to indicate the number of a spring turn required for the use.

   (Example) Spring, tension (24T); This spring must be cut at its 24th turn for actual use.

6. Screws
   - All the screws used in this machine are the TOTSU type unless otherwise noted. The screws are interchangeable with the Phillips type (⊕) and slotted type (⊖) screws.
   - Please order as the following part number when ordering the TOTSU type screws.

Size	PS	PSW	B (BZnN)	B (Cr-N)	PTT	PTTWH
2.6 x 4	7-621-972-05	———	7-621-912-10	7-621-912-18	———	———
2.6 x 6	7-621-972-25	———	7-621-912-30	7-621-912-38	———	———
2.6 x 8	7-621-972-35	———	7-621-912-40	7-621-912-48	———	———
2.6 x 10	7-621-972-45	———	7-621-912-50	7-621-912-58	———	———
2.6 x 12	7-621-972-55	———	7-621-912-60	7-621-912-68	———	———
3 x 6	7-686-447-01	7-686-527-01	7-686-624-09	7-686-624-04	7-687-411-31	7-687-510-31
3 x 8	7-686-448-01	7-686-528-01	7-686-625-09	7-686-625-04	7-687-412-31	7-687-511-31
3 x 10	7-686-449-01	7-686-529-01	7-686-626-09	7-686-626-04	7-687-413-31	7-687-512-31
3 x 12	7-686-450-01	7-686-530-01	7-686-627-09	7-686-627-04	———	———
3 x 16	7-686-452-01	7-686-532-01	7-686-629-09	7-686-629-04	———	———
3 x 25	7-686-454-01	7-686-534-01	7-686-631-09	7-686-631-04	———	———
4 x 8	7-686-468-01	———	———	7-686-635-04	———	———
4 x 12	7-686-470-01	———	———	7-686-637-04	———	———
4 x 14	7-686-471-01	———	———	7-686-638-04	———	———
4 x 16	7-686-472-01	———	———	7-686-639-04	———	———
4 x 20	7-686-473-01	———	———	7-686-640-04	———	———

5-3. ELECTRICAL PARTS LIST

Ref. No. Parts No. Description

MOUNTED BOARD

① A-6257-018-A VIDO board (former)
② A-6257-024-A VIDO board (new)
1. ① Serial No. up to 10040; USA/CND
Serial No. up to 10010; JAPAN
② Serial No. 10041 and higher; USA/CND
Serial No. 10011 and higher; JAPAN
Serial No. 10001 and higher; AEP
2. New board can substitute for former board.
3. Former board cannot substitute for new board.

A-6259-046-A FRNT board
A-6259-047-A GENR board

① A-6259-048-A REDR board (former)
② A-6259-048-B REDR board (new)
1. ① Serial No. up to 10040; USA/CND
Serial No. up to 10010; JAPAN
② Serial No. 10041 and higher; USA/CND
Serial No. 10011 and higher; JAPAN
Serial No. 10001 and higher; AEP
2. New board can substitute for former board.
3. Former board cannot substitute for new board.

A-6265-015-A MHRB board

PRINTED WIRING BOARD

1-587-454-00 CONP board
1-587-455-00 TRNS board
1-587-456-00 SWB1 board
1-587-457-00 SWB2 board

NOTE:

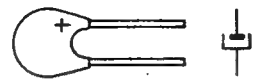
1. The shaded and ⚠-marked components are critical to safety.
Replace only with same component as specified.

2. Parts printed in **Bold-Face type** are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.

CAPACITOR – FIXED

Parts that are not listed in the "reference numbers order list" are shown in following table.
Reference numbers are omitted.

TANTALUM ELECTROLYTIC CAPACITOR



0.1μF through 100μF ±10%
3.15V through 35V

Parts No. 1-131-□□□-00

Value		Parts No. – □□□ –
0.1μF	35V	209
0.15	35	210
0.22	35	211
0.33	35	212
0.47	35	213
0.68	35	214
1	25	236
	35	215
1.5	20	237
	25	
	35	216
2.2	20	217
	25	
	35	
3.3	16	218
	20	
	25	
	35	
4.7	10	232
	16	
	20	219
	25	
	35	
6.8	6.3	198
	10	
	16	

Value		Parts No. – □□□ –
6.8μF	20V	239
	25	
	35	
10	3.15	182
	6.3	199
	10	
	16	
	20	238
	25	
15	3.15	227
	6.3	189
	10	194
	16	200
	20	235
22	3.15	201
	6.3	
	10	
	16	
33	3.15	184
	6.3	196
	10	
47	3.15	191
	6.3	
68	3.15	186
100	3.15	187

All capacitors are in micro farads unless otherwise indicated.

Ref. No.	Parts No.	Description			
frame					
C1	1-108-591-00	mylar	0.033	5%	50V
C2	1-108-591-00	mylar	0.033	5%	50V
C3	1-108-591-00	mylar	0.033	5%	50V
C4	1-108-591-00	mylar	0.033	5%	50V
C5	1-108-591-00	mylar	0.033	5%	50V
C6	1-108-591-00	mylar	0.033	5%	50V
C7	1-108-591-00	mylar	0.033	5%	50V
C8	1-108-591-00	mylar	0.033	5%	50V
C9	1-123-400-00	elect	10000		35V
C10	1-123-400-00	elect	10000		35V
C11	1-123-399-00	elect	22000		16V

Ref. No.	Parts No.	Description			
FRNT board					
C2008	1-161-043-00	ceramic	0.0022		50V
GENR board					
C3001	1-123-308-00	elect	220		10V
C3027	1-107-102-00	mica	5pF		50V
	USA/CND; up to #10060, J; up to #10040				
	1-107-071-00	mica	27pF		50V
	USA/CND; #10061-, J; #10041-. AEP; #10001-				
C3029	1-108-227-00	mylar	0.001	10%	50V
C3030	1-161-045-00	ceramic	0.0033		50V
C3031	1-108-227-00	mylar	0.001	10%	50V
C3032	1-161-057-00	ceramic	0.033		25V
C3033	1-102-824-00	ceramic	470pF		50V
C3034	1-102-824-00	ceramic	470pF		50V
C3035	1-108-579-00	mylar	0.01	5%	50V
C3038	1-102-824-00	ceramic	470pF		50V
C3040	1-108-227-00	mylar	0.001	10%	50V
C3041	1-161-053-00	ceramic	0.015		50V
C3042	1-102-824-00	ceramic	470pF		50V
C3043	1-102-824-00	ceramic	470pF		50V
C3044	1-102-824-00	ceramic	470pF		50V
C3046	1-108-227-00	mylar	0.001	10%	50V
C3152	1-102-106-00	ceramic	100pF	10%	50V
C3153	1-102-106-00	ceramic	100pF	10%	50V
REDR board					
C5001	1-123-308-00	elect	220		10V
C5037	1-102-973-00	ceramic	100pF		50V
C5041	1-102-973-00	ceramic	100pF		50V
C5042	1-102-973-00	ceramic	100pF		50V
C5043	1-102-973-00	ceramic	100pF		50V
C5044	1-102-973-00	ceramic	100pF		50V
C5045	1-102-824-00	ceramic	470pF		50V
C5046	1-161-039-00	ceramic	0.001		50V
C5047	1-102-973-00	ceramic	100pF		50V

NOTE:

1. **The shaded and ⚠-marked components are critical to safety.**
   Replace only with same component as specified.

2. Parts printed in **Bold-Face** type are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.

Ref. No.	Parts No.	Description			
C5048	1-102-973-00	ceramic	100pF		50V
C5049	1-102-820-00	ceramic	330pF		50V
C5050	1-102-824-00	ceramic	470pF		50V
C5052	1-102-973-00	ceramic	100pF		50V
C5053	1-108-595-00	mylar	0.047	5%	50V
C5054	1-102-824-00	ceramic	470pF		50V
C5055	1-102-973-00	ceramic	100pF		50V
C5056	1-102-973-00	ceramic	100pF		50V
C5057	1-102-973-00	ceramic	100pF		50V
C5060	1-102-824-00	ceramic	470pF		50V
C5061	1-102-973-00	ceramic	100pF		50V
C5062	1-102-074-00	ceramic	0.001(B)		50V
VIDO board					
Serial No. up to 10040 (USA/CND)					
Serial No. up to 10010 (JAPAN)					
C7001	1-161-051-00	ceramic	0.01		50V
C7002	1-161-051-00	ceramic	0.01		50V
C7003	1-107-092-00	mica	200pF	5%	50V
C7004	1-107-092-00	mica	200pF	5%	50V
C7005	1-107-087-00	mica	120pF	5%	50V
C7006	1-107-087-00	mica	120pF	5%	50V
C7007	1-161-051-00	ceramic	0.01		50V
C7008	1-108-239-00	mylar	0.01	10%	50V
C7009	1-107-081-00	mica	68pF	5%	50V
C7010	1-107-081-00	mica	68pF	5%	50V
C7011	1-107-081-00	mica	68pF	5%	50V
C7012	1-161-051-00	ceramic	0.01		50V
C7013	1-107-081-00	mica	68pF	5%	50V
C7014	1-161-051-00	ceramic	0.01		50V
C7015	1-107-065-00	mica	15pF	5%	50V
C7016	1-107-065-00	mica	15pF	5%	50V
C7017	1-161-051-00	ceramic	0.01		50V
C7018	1-161-051-00	ceramic	0.01		50V
C7019	1-161-051-00	ceramic	0.01		50V
C7020	1-161-051-00	ceramic	0.01		50V
C7033	1-107-062-00	mica	11pF	5%	50V
C7038	1-161-051-00	ceramic	0.01		50V
C7039	1-107-062-00	mica	11pF	5%	50V
C7050	1-161-051-00	ceramic	0.01		50V
C7051	1-123-308-00	elect	220		10V
C7052	1-108-228-00	mylar	0.0015	10%	50V
C7053	1-109-545-00	mica	270pF	5%	100V
C7054	1-161-049-00	ceramic	0.0068		50V
C7055	1-161-044-00	ceramic	0.0027		50V
C7056	1-161-049-00	ceramic	0.0068		50V

Ref. No.	Parts No.	Description			
C7057	1-161-044-00	ceramic	0.0027		50V
C7058	1-109-545-00	mica	270pF	5%	100V
C7059	1-108-239-00	mylar	0.01	10%	50V
C7060	1-108-240-00	mylar	0.015	10%	50V
C7062	1-108-227-00	mylar	0.001	10%	50V
C7063	1-108-227-00	mylar	0.001	10%	50V
C7067	1-108-239-00	mylar	0.01	10%	50V
C7069	1-102-820-00	ceramic	330pF		50V
C7074	1-107-065-00	mica	15pF	5%	50V
C7077	1-161-045-00	ceramic	0.0033		50V
C7078	1-107-065-00	mica	15pF	5%	50V
C7080	1-161-051-00	ceramic	0.01		50V
C7084	1-107-065-00	mica	15pF	5%	50V
C7085	1-161-039-00	ceramic	0.001		50V
C7088	1-161-051-00	ceramic	0.01		50V
C7089	1-161-051-00	ceramic	0.01		50V
C7091	1-107-092-00	mica	200pF	5%	50V
C7092	1-107-092-00	mica	200pF	5%	50V
C7102	1-161-039-00	ceramic	0.001		50V
C7103	1-161-051-00	ceramic	0.01		50V
C7106	1-161-051-00	ceramic	0.01		50V
C7109	1-107-092-00	mica	200pF	5%	50V
C7110	1-107-092-00	mica	200pF	5%	50V
C7114	1-107-065-00	mica	15pF	5%	50V
C7116	1-161-051-00	ceramic	0.01		50V
C7117	1-161-051-00	ceramic	0.01		50V
C7120	1-107-092-00	mica	200pF	5%	50V
C7121	1-107-092-00	mica	200pF	5%	50V
C7123	1-161-051-00	ceramic	0.01		50V
C7124	1-161-051-00	ceramic	0.01		50V
C7125	1-123-332-00	elect	47		25V
C7138	1-109-539-00	mica	150pF	5%	100V
C7141	1-161-051-00	ceramic	0.01		50V
C7142	1-123-332-00	elect	47		25V
C7143	1-161-051-00	ceramic	0.01		50V

Ref. No.	Parts No.	Description			
C7144	1-123-332-00	elect	47		25V
C7145	1-123-332-00	elect	47		25V
C7150	1-161-051-00	ceramic	0.01		50V
C7151	1-161-051-00	ceramic	0.01		50V
C7155	1-107-072-00	mica	30pF	5%	50V
C7158	1-102-074-00	ceramic	0.001		50V
C7159	1-102-074-00	ceramic	0.001		50V
C7160	1-102-074-00	ceramic	0.001		50V
C7161	1-161-051-00	ceramic	0.01		50V

VIDO board

Serial No. 10041 and higher (USA/CND)
Serial No. 10011 and higher (JAPAN)
Serial No. 10001 and higher (AEP)

C7003	1-107-092-00	mica	200pF	5%	50V
C7004	1-107-092-00	mica	200pF	5%	50V
C7005	1-161-013-00	ceramic	0.01		25V
C7006	1-131-450-00	tantalum	1	20%	35V
C7007	1-161-013-00	ceramic	0.01		25V
C7008	1-131-450-00	tantalum	1	20%	35V
C7009	1-131-450-00	tantalum	1	20%	35V
C7010	1-131-450-00	tantalum	1	20%	35V
C7012	1-107-065-00	mica	15pF	5%	50V
C7013	1-161-013-00	ceramic	0.01		25V
C7015	1-131-450-00	tantalum	1	20%	35V
C7016	1-161-013-00	ceramic	0.01		25V
C7019	1-107-092-00	mica	200pF	5%	50V
C7020	1-107-092-00	mica	200pF	5%	50V
C7021	1-131-450-00	tantalum	1	20%	35V
C7022	1-131-450-00	tantalum	1	20%	35V
C7023	1-102-074-00	ceramic	0.001		50V
C7024	1-107-065-00	mica	15pF	5%	50V
C7026	1-131-450-00	tantalum	1	20%	35V
C7027	1-131-450-00	tantalum	1	20%	35V
C7028	1-161-003-00	ceramic	0.0015		25V
C7030	1-107-092-00	mica	200pF	5%	50V
C7031	1-107-092-00	mica	200pF	5%	50V
C7032	1-131-450-00	tantalum	1	20%	35V
C7033	1-131-450-00	tantalum	1	20%	35V
C7034	1-161-013-00	ceramic	0.01		25V
C7038	1-107-065-00	mica	15pF	5%	50V
C7039	1-107-065-00	mica	15pF	5%	50V
C7040	1-161-013-00	ceramic	0.01		25V
C7043	1-161-013-00	ceramic	0.01		25V

NOTE:

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Ref. No.	Part No.	Description			
C7046	1-107-092-00	mica	200pF	5%	50V
C7047	1-107-092-00	mica	200pF	5%	50V
C7050	1-161-013-00	ceramic	0.01		25V
C7052	1-131-450-00	tantalum	1	20%	35V
C7053	1-131-450-00	tantalum	1	20%	35V
C7054	1-161-013-00	ceramic	0.01		25V
C7055	1-107-081-00	mica	68pF	5%	50V
C7056	1-107-081-00	mica	68pF	5%	50V
C7057	1-161-013-00	ceramic	0.01		25V
C7058	1-161-013-00	ceramic	0.01		25V
C7060	1-107-062-00	mica	11pF	5%	50V
C7061	1-161-013-00	ceramic	0.01		25V
C7062	1-108-579-00	mylar	0.01	5%	50V
C7063	1-107-081-00	mica	68pF	5%	50V
C7064	1-107-081-00	mica	68pF	5%	50V
C7065	1-161-013-00	ceramic	0.01		25V
C7066	1-161-013-00	ceramic	0.01		25V
C7068	1-107-065-00	mica	15pF	5%	50V
C7069	1-107-065-00	mica	15pF	5%	50V
C7070	1-161-013-00	ceramic	0.01		25V
C7072	1-131-450-00	tantalum	1	20%	35V
C7073	1-161-013-00	ceramic	0.01		25V
C7077	1-161-013-00	ceramic	0.01		25V
C7078	1-131-450-00	tantalum	1	20%	35V
C7079	1-131-450-00	tantalum	1	20%	35V
C7080	1-131-450-00	tantalum	1	20%	35V
C7081	1-131-450-00	tantalum	1	20%	35V
C7083	1-107-087-00	mica	120pF	5%	50V
C7084	1-107-087-00	mica	120pF	5%	50V
C7085	1-131-450-00	tantalum	1	20%	35V
C7086	1-131-450-00	tantalum	1	20%	35V
C7087	1-161-013-00	ceramic	0.01		25V
C7089	1-131-450-00	tantalum	1	20%	35V
C7091	1-109-545-00	mica	270pF	5%	100V
C7092	1-102-122-00	ceramic	0.0027		50V
C7093	1-108-575-00	mylar	0.0068	5%	50V
C7094	1-108-559-00	mylar	0.0015	5%	50V
C7095	1-108-583-00	mylar	0.015	5%	50V
C7096	1-102-112-00	ceramic	330pF		50V
C7099	1-109-545-00	mica	270pF	5%	100V
C7100	1-161-043-00	ceramic	0.0022		50V
C7101	1-108-575-00	mylar	0.0068	5%	50V
C7102	1-108-579-00	mylar	0.01	5%	50V
C7103	1-108-579-00	mylar	0.01	5%	50V
C7106	1-108-579-00	mylar	0.01	5%	50V
C7109	1-108-555-00	mylar	0.001	5%	50V
C7110	1-102-074-00	ceramic	0.001		50V
C7111	1-107-062-00	mica	11pF	5%	50V
C7112	1-109-539-00	mica	150pF	5%	100V
C7114	1-131-450-00	tantalum	1	20%	35V
C7115	1-131-450-00	tantalum	1	20%	35V
C7116	1-131-450-00	tantalum	1	20%	35V
C7117	1-131-450-00	tantalum	1	20%	35V
C7118	1-131-450-00	tantalum	1	20%	35V
C7119	1-131-450-00	tantalum	1	20%	35V
C7120	1-131-450-00	tantalum	1	20%	35V
C7121	1-123-308-00	elect	220		10V
C7122	1-161-013-00	ceramic	0.01		25V
C7123	1-161-013-00	ceramic	0.01		25V
C7124	1-161-013-00	ceramic	0.01		25V
C7126	1-161-013-00	ceramic	0.01		25V
C7127	1-161-013-00	ceramic	0.01		25V
C7129	1-161-013-00	ceramic	0.01		25V
C7131	1-131-450-00	tantalum	1	20%	35V
C7132	1-131-450-00	tantalum	1	20%	35V
C7133	1-131-450-00	tantalum	1	20%	35V
C7134	1-131-450-00	tantalum	1	20%	35V
C7135	1-131-450-00	tantalum	1	20%	35V
C7136	1-131-450-00	tantalum	1	20%	35V
C7137	1-131-450-00	tantalum	1	20%	35V
C7138	1-131-450-00	tantalum	1	20%	35V
C7139	1-131-450-00	tantalum	1	20%	35V
C7140	1-131-450-00	tantalum	1	20%	35V
C7141	1-131-450-00	tantalum	1	20%	35V
C7145	1-107-087-00	mica	120pF	5%	50V
C7146	1-107-061-00	mica	10pF	5%	50V
C7147	1-107-092-00	mica	200pF	5%	50V
C7148	1-107-092-00	mica	200pF	5%	50V

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Ref. No.	Parts No.	Description

CONNECTOR

frame

⚠CN1	1-508-680-00	housing, 6P
	1-535-070-11	contact, male
⚠CN2	1-508-683-00	housing, 6P
	1-535-072-00	contact, female
⚠CN3	1-508-879-00	housing, 9P
	1-535-070-11	contact, male
⚠CN4	1-508-840-00	housing, 9P
	1-535-072-00	contact, female
CN6	**1-509-184-00**	**receptacle, female, XLR, 3P; TC IN (USA/CND)**
CN6	**1-509-176-00**	**receptacle, male, XLR, 3P; TC IN (J)**
CN7	**1-509-176-00**	**receptacle, male, XLR, 3P; TC OUT (USA/CND)**
CN7	**1-509-184-00**	**receptacle, female, XLR, 3P; TC OUT (J)**
CN8	**1-509-184-00**	**receptacle, female, XLR, 3P; TC IN (USA/CND)**
CN8	**1-509-176-00**	**receptacle, male, XLR, 3P; TC IN (J)**
CN9	**1-509-176-00**	**receptacle, male, XLR, 3P; TC OUT (USA/CND)**
CN9	**1-509-184-00**	**receptacle, female, XLR, 3P; TC OUT (J)**
CN10,11 CN201,401	**1-931-860-00**	**flat cable with connectors**

CONP board

CN1001	**1-561-053-00**	**receptacle, female, BNC**
CN1003	**1-561-053-00**	**receptacle, female, BNC**
CN1004	**1-561-053-00**	**receptacle, female, BNC**
CN1005	**1-561-053-00**	**receptacle, female, BNC**
CN1006	**1-561-053-00**	**receptacle, female, BNC**
CN1007	**1-561-053-00**	**receptacle, female, BNC**
CN1008	**1-561-053-00**	**receptacle, female, BNC**
CN1009	**1-561-053-00**	**receptacle, female, BNC**
CN1010	**1-561-053-00**	**receptacle, female, BNC**
CN1012	**1-561-053-00**	**receptacle, female, BNC**

FRNT board

CN2001	1-560-028-00	receptacle, male, 20P
CN2002	1-526-604-00	receptacle, female, 14P, IC (for 7-segment LED)
CN2003	1-526-604-00	receptacle, female, 14P, IC (for 7-segment LED)
CN2004	1-526-604-00	receptacle, female, 14P, IC (for 7-segment LED)
CN2005	1-526-604-00	receptacle, female, 14P, IC (for 7-segment LED)
CN2006	1-526-604-00	receptacle, female, 14P, IC (for 7-segment LED)
CN2007	1-526-604-00	receptacle, female, 14P, IC (for 7-segment LED)
CN2008	1-526-604-00	receptacle, female, 14P, IC (for 7-segment LED)
CN2009	1-526-604-00	receptacle, female, 14P, IC (for 7-segment LED)

MHRB board

CN4001	1-560-054-00	receptacle, female, 50P
CN4002	1-560-054-00	receptacle, female, 50P
CN4003	1-560-054-00	receptacle, female, 50P
CN4004	1-560-029-00	receptacle, male, 40P

DIODE

frame

D1	**8-719-300-50**	**SG-5TS**
D2	**8-719-300-51**	**SG-5TR**
D3	**8-719-300-50**	**SG-5TS**
D4	**8-719-300-51**	**SG-5TR**

CONP board

D1001	**8-719-931-13**	**EQB01-13**
D1002	**8-719-931-13**	**EQB01-13**
D1003	**8-719-815-55**	**1S1555**

FRNT board

D2001	**8-719-815-55**	**1S1555**
D2002	**8-719-815-55**	**1S1555**
D2003	**8-719-815-55**	**1S1555**
D2004	**8-719-949-70**	**(5082-4970) HLMP-0501**
D2005	**8-719-949-70**	**(5082-4970) HLMP-0501**
D2006	**8-719-949-70**	**(5082-4970) HLMP-0501**
D2007	**8-719-949-70**	**(5082-4970) HLMP-0501**
D2008	**8-719-907-01**	**BD-701R**
D2009	**8-719-907-03**	**BD-703G**
D2010	**8-719-949-70**	**(5082-4970) HLMP-0501**

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Ref. No.	Parts No.	Description
D2011	8-719-949-70	(5082-4970) HLMP-0501
D2012	8-719-801-02	TLR102, LED, red
D2013	8-719-976-52	5082-7650B
D2014	8-719-976-52	5082-7650B
D2015	8-719-976-52	5082-7650B
D2016	8-719-976-52	5082-7650B
D2017	8-719-976-52	5082-7650B
D2018	8-719-976-52	5082-7650B
D2019	8-719-976-52	5082-7650B
D2020	8-719-976-52	5082-7650B

REDR board

D5001	8-719-815-55	1S1555
D5002	8-719-815-55	1S1555
D5003	8-719-930-12	EQB01-12Z

VIDO board

Serial No. up to 10040 (USA/CND)
Serial No. up to 10010 (JAPAN)

D7001	8-719-931-13	EQB01-13
D7002	8-719-815-55	1S1555
D7003	8-719-815-55	1S1555
D7004	8-719-815-55	1S1555
D7005	8-719-815-55	1S1555
D7006	8-719-931-13	EQB01-13
D7007	8-719-815-55	1S1555
D7008	8-719-815-55	1S1555
D7009	8-719-931-13	EQB01-13
D7010	8-719-815-55	1S1555
D7011	8-719-815-55	1S1555
D7012	8-719-815-55	1S1555
D7013	8-719-815-55	1S1555
D7014	8-719-815-55	1S1555
D7015	8-719-815-55	1S1555

VIDO board

Serial No. 10041 and higher (USA/CND)
Serial No. 10011 and higher (JAPAN)
Serial No. 10001 and higher (AEP)

D7001	8-719-815-55	1S1555
D7002	8-719-815-55	1S1555
D7003	8-719-931-13	EQB01-13
D7004	8-719-815-55	1S1555
D7005	8-719-815-55	1S1555
D7006	8-719-931-13	EQB01-13
D7007	8-719-931-13	EQB01-13
D7008	8-719-815-55	1S1555
D7009	8-719-815-55	1S1555
D7010	8-719-815-55	1S1555
D7011	8-719-815-55	1S1555
D7012	8-719-815-55	1S1555
D7013	8-719-815-55	1S1555
D7014	8-719-815-55	1S1555
D7015	8-719-815-55	1S1555

FUSE

frame

⚠ F1	1-532-268-XX	2A	(USA/CND)
	1-532-363-XX	2A	(J)
	1-532-078-00	T1A	(AEP)

FERRITE BEADS

CONP board

FB1001	1-535-180-00
FB1002	1-535-180-00
FB1003	1-535-180-00
FB1004	1-535-180-00
FB1005	1-535-180-00
FB1006	1-535-180-00

REDR board

FB5001	1-535-178-00

IC

frame

IC1	8-759-928-15	μA7815KC; FSC
IC2	8-759-979-15	μA7915KC; FSC
IC3	8-759-918-05	μA78H05ASC; FSC

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Ref. No.	Parts No.	Description
FRNT board		
IC2001	8-759-900-14	SN74LS14N; TI
IC2002	8-759-974-07	SN7407N; TI
IC2003	8-759-902-51	SN74LS251N; TI
IC2004	8-759-902-51	SN74LS251N; TI
IC2005	8-759-974-47	SN7447AN; TI
IC2006	8-759-900-03	SN74LS03N; TI
IC2007	8-759-904-42	SN7442AN; TI
IC2008	8-759-902-51	SN74LS251N; TI
IC2009	8-759-902-51	SN74LS251N; TI
IC2010	8-759-901-09	SN74LS109N; TI
GENR board		
IC3000-A1	8-759-900-05	SN74LS05N; TI
IC3000-A2	8-759-901-70	SN74LS170N; TI
IC3000-A3	8-759-900-04	SN74LS04N; TI
IC3000-A4	8-759-632-06	(SN7406N; TI) M53206P
IC3000-A5	8-759-900-14	SN74LS14N; TI
IC3000-A6	8-759-110-08	μPC1008C; NEC (MC4044P; MOTOROLA)
IC300-A7	8-759-903-24	SN74LS324N; TI USA/CND; up to #10060, J; up to #10040
	8-759-911-24	SN74S124N; TI USA/CND; #10061-, J; #10041-, AEP; #10001-
IC3000-B1	8-759-901-58	SN74LS158N; TI
IC3000-B2	8-759-901-70	SN74LS170N; TI
IC3000-B3	8-759-900-04	SN74LS04N; TI
IC3000-B4	8-759-941-60	SN74160N; TI
IC3000-B5	8-759-900-38	SN74LS38N; TI
IC3000-B6	8-759-901-09	SN74LS109N; TI
IC3000-C1	8-759-901-57	SN74LS157N; TI
IC3000-C2	8-759-900-04	SN74LS04N; TI
IC3000-C3	8-759-901-51	SN74LS151N; TI
IC3000-C4	8-759-941-61	SN74161N; TI
IC3000-C5	8-759-901-51	SN74LS151N; TI
IC3000-C6	8-759-900-04	SN74LS04N; TI

Ref. No.	Parts No.	Description
IC3000-C7	8-759-900-11	SN74LS11N; TI
IC3000-C8	8-759-941-61	SN74161N; TI
IC3000-D1	8-759-974-89	SN7489N; TI
IC3000-D2	8-579-901-57	SN74LS157N; TI
IC3000-D3	8-759-900-86	SN74LS86N; TI
IC3000-D4	8-759-900-42	SN74LS42N; TI
IC3000-D5	8-759-900-02	SN74LS02N; TI
IC3000-D6	8-759-900-00	SN74LS00N; TI
IC3000-D7	8-759-900-51	SN74LS51N; TI
IC3000-D8	8-759-900-86	SN74LS86N; TI
IC3000-E1	8-759-974-89	SN7489N; TI
IC3000-E2	8-759-941-60	SN74160N; TI
IC3000-E3	8-759-901-64	SN74LS164N; TI
IC3000-E5	8-759-901-09	SN74LS109N; TI
IC3000-E6	8-759-901-09	SN74LS109N; TI
IC3000-E7	8-759-901-09	SN74LS109N; TI
IC3000-E8	8-759-901-64	SN74LS164N; TI
IC3000-F1	8-759-902-51	SN74LS251N; TI
IC3000-F2	8-759-941-61	SN74161N; TI
IC3000-F3	8-759-901-23	SN74LS123N; TI
IC3000-F4	8-759-040-46	MC14046BCP; MOTOROLA
IC3000-F5	8-759-900-32	SN74LS32N; TI
IC3000-F6	8-759-901-12	SN74LS112N; TI
IC3000-F7	8-759-941-61	SN74161N; TI
IC3000-F8	8-759-941-61	SN74161N; TI
IC3000-G1	8-759-902-51	SN74LS251N; TI
IC3000-G2	8-759-900-20	SN74LS20N; TI
IC3000-G3	8-759-900-27	SN74LS27N; TI
IC3000-G4	8-759-900-04	SN74LS04N; TI
IC3000-G5	8-759-901-12	SN74LS112N; TI
IC3000-G6	8-759-900-08	SN74LS08N; TI
IC3000-G7	8-759-900-03	SN74LS03N; TI
IC3000-H1	8-759-900-02	SN74LS02N; TI
IC3000-H2	8-759-632-06	(SN7406N; TI) M53206P
IC3000-H3	8-759-900-42	SN74LS42N; TI
IC3000-H4	8-759-900-02	SN74LS02N; TI
IC3000-H5	8-759-900-00	SN74LS00N; TI
IC3000-H6	8-759-900-04	SN74LS04N; TI
IC3000-H7	8-759-941-20	SN74120N; TI

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IC3000-I1	8-759-900-00	SN74LS00N; TI
IC3000-I2	8-759-900-00	SN74LS00N; TI
IC3000-I3	8-759-900-00	SN74LS00N; TI
IC3000-I4	8-759-900-04	SN74LS04N; TI
IC3000-I5	8-759-902-59	SN74LS259AN; TI
IC3000-I6	8-759-941-20	SN74120N; TI
IC3000-I7	8-759-901-09	SN74LS109N; TI
IC3000-J1	8-759-900-04	SN74LS14N; TI
IC3000-J2	8-759-900-02	SN74LS02N; TI
IC3000-J3	8-759-900-02	SN74LS02N; TI
IC3000-J4	8-759-751-05	MB7052-BV2; P-ROM
IC3000-J5	8-759-902-59	SN74LS259AN; TI
IC3000-J6	8-759-900-05	SN74LS05N; TI
IC3000-J7	8-759-900-08	SN74LS08N; TI
IC3000-J8	8-759-900-27	SN74LS27N; TI
IC3000-K1	8-759-901-64	SN74LS164N; TI
IC3000-K2	8-759-974-25	SN7425N; TI
IC3000-K3	8-759-901-64	SN74LS164N; TI
IC3000-K4	8-759-902-83	SN74LS283N; TI
IC3000-K5	8-759-901-51	SN74LS151N; TI
IC3000-K6	8-759-900-00	SN74LS00N; TI
IC3000-K7	8-759-900-10	SN74LS10N; TI
IC3000-K8	8-759-901-64	SN74LS164N; TI
IC3000-L1	8-759-901-64	SN74LS164N; TI
IC3000-L2	8-759-974-25	SN7425N; TI
IC3000-L3	8-759-901-64	SN74LS164N; TI
IC3000-L4	8-759-901-09	SN74LS109N; TI
IC3000-L5	8-759-900-20	SN74LS20N; TI
IC3000-L6	8-759-900-04	SN74LS04N; TI
IC3000-L7	8-759-900-32	SN74LS32N; TI
IC3000-L8	8-759-900-11	SN74LS11N; TI
IC3000-M2	8-759-901-09	SN74LS109N; TI
IC3000-M3	8-759-902-21	SN74LS221N; TI

Ref. No.	Parts No.	Description
REDR board		
IC5000-A1	8-759-900-00	SN74LS00N; TI
IC5000-A2	8-759-901-64	SN74LS164N; TI
IC5000-A3	8-759-900-14	SN74LS14N; TI
IC5000-A4	8-759-902-59	SN74LS259AN; TI
IC5000-A5	8-759-900-14	SN74LS14N; TI
IC5000-A6	8-759-900-14	SN74LS14N; TI
IC5000-A7	8-759-900-38	SN74LS38N; TI
IC5000-B1	8-759-900-00	SN74LS00N; TI
IC5000-B2	8-759-900-86	SN74LS86N; TI
IC5000-B3	8-759-900-10	SN74LS10N; TI
IC5000-B4	8-759-901-51	SN74LS151N; TI
IC5000-B5	8-759-900-04	SN74LS04N; TI
IC5000-B6	8-759-902-57	SN74LS257N; TI
IC5000-B7	8-759-911-89	SN74S189N; TI
IC5000-B8	8-759-900-00	SN74LS00N; TI
IC5000-C1	8-759-901-95	SN74LS195N; TI
IC5000-C2	8-759-941-09	SN74109N; TI
IC5000-C3	8-759-901-09	SN74LS109N; TI
IC5000-C4	8-759-901-91	SN74LS191N; TI
IC5000-C5	8-759-751-04	MB7052-BV1; P-ROM
IC5000-C6	8-759-902-57	SN74LS257N; TI
IC5000-C7	8-759-902-58	SN74LS258N; TI
IC5000-C8	8-759-901-64	SN74LS164N; TI
IC5000-D1	8-759-901-91	SN74LS191N; TI
IC5000-D2	8-759-901-91	SN74LS191N; TI
IC5000-D3	8-759-900-04	SN74LS04N; TI
IC5000-D4	8-759-901-90	SN74LS190N; TI
IC5000-D5	8-759-901-51	SN74LS151N; TI
IC5000-D6	8-759-911-89	SN74S189N; TI
IC5000-D7	8-759-902-58	SN74LS258N; TI
IC5000-D8	8-759-974-25	SN7425N; TI
IC5000-E1	8-759-901-91	SN74LS191N; TI
IC5000-E2	8-759-901-91	SN74LS191N; TI
IC5000-E3	8-759-902-93	SN74LS293N; TI
IC5000-E4	8-759-900-00	SN74LS00N; TI

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IC5000-E5	8-759-900-51	**SN74LS51N; TI**
IC5000-E6	8-759-900-85	**SN74LS85N; TI**
IC5000-E7	8-759-902-57	**SN74LS257N; TI**
IC5000-E8	8-759-901-64	**SN74LS164N; TI**
IC5000-F1	8-759-901-91	**SN74LS191N; TI**
IC5000-F2	8-759-901-91	**SN74LS191N; TI**
IC5000-F3	8-759-900-08	**SN74LS08N; TI**
IC5000-F4	8-759-900-04	**SN74LS04N; TI**
IC5000-F5	8-759-900-12	**SN74LS12N; TI**
IC5000-F6	8-759-900-84	**SN74LS86N; TI**
IC5000-F7	8-759-902-57	**SN74LS257N; TI**
IC5000-F8	8-759-901-64	**SN74LS164N; TI**
IC5000-G1	8-759-901-91	**SN74LS191N; TI**
IC5000-G2	8-759-901-91	**SN74LS191N; TI**
IC5000-G3	8-759-911-89	**SN74S189N; TI**
IC5000-G4	8-759-902-58	**SN74LS258N; TI**
IC5000-G5	8-759-900-08	**SN74LS08N; TI**
IC5000-G6	8-759-902-83	**SN74LS283N; TI**
IC5000-G7	8-759-900-86	**SN74LS86N; TI**
IC5000-G8	8-759-974-25	**SN7425N; TI**
IC5000-H2	8-759-974-25	**SN7425N; TI**
IC5000-H3	8-759-901-94	**SN74LS194N; TI**
IC5000-H4	8-759-911-89	**SN74S189N; TI**
IC5000-H5	8-759-901-09	**SN74LS109N; TI**
IC5000-H6	8-759-751-05	**MB7052-BV2; P-ROM**
IC5000-H7	8-759-900-00	**SN74LS00N; TI**
IC5000-H8	8-759-901-64	**SN74LS164N; TI**
IC5000-I1	8-759-901-90	**SN74LS190N; TI**
IC5000-I2	8-759-900-12	**SN74LS12N; TI**
IC5000-I3	8-759-902-57	**SN74LS257N; TI**
IC5000-I4	8-759-901-89	**SN74S189N; TI**
IC5000-I5	8-759-902-57	**SN74LS257N; TI**
IC5000-I6	8-759-900-27	**SN74LS27N; TI**
IC5000-I7	8-759-941-09	**SN74109N; TI**
IC5000-I8	8-759-900-20	**SN74LS20N; TI**

Ref. No.	Parts No.	Description
IC5000-J1	8-759-901-91	**SN74LS191N; TI**
IC5000-J2	8-759-900-86	**SN74LS86N; TI**
IC5000-J3	8-759-901-09	**SN74LS109N; TI**
IC5000-J4	8-759-901-64	**SN74LS164N; TI**
IC5000-J5	8-759-974-25	**SN7425N; TI**
IC5000-J6	8-759-941-61	**SN74161N; TI**
IC5000-J7	8-759-900-10	**SN74LS10N; TI**
IC5000-J8	8-759-900-04	**SN74LS04N; TI**
IC5000-K1	8-759-900-04	**SN74LS04N; TI**
IC5000-K2	8-759-900-20	**SN74LS20N; TI**
IC5000-K3	8-759-902-79	**SN74LS279N; TI**
IC5000-K4	8-759-901-95	**SN74LS195N; TI**
IC5000-K5	8-759-900-11	**SN74LS11N; TI**
IC5000-K6	8-759-900-27	**SN74LS27N; TI**
IC5000-K7	8-759-900-11	**SN74LS11N; TI**
IC5000-K8	8-759-900-02	**SN74LS02N; TI**
IC5000-L1	8-759-900-02	**SN74LS02N; TI**
IC5000-L2	8-759-900-32	**SN74LS32N; TI**
IC5000-L3	8-759-901-95	**SN74LS195N; TI**
IC5000-L4	8-759-900-32	**SN74LS32N; TI**
IC5000-L5	8-759-901-23	**SN74LS123N; TI**
IC5000-L6	8-759-941-20	**SN74120N; TI**
IC5000-L7	8-759-901-09	**SN74LS109N; TI**
IC5000-L8	8-759-900-04	**SN74LS04N; TI**
IC5000-M1	8-759-900-00	**SN74LS00N; TI**
IC5000-M2	8-759-900-10	**SN74LS10N; TI**
IC5000-M3	8-759-900-20	**SN74LS20N; TI**
IC5000-M4	8-759-901-90	**SN74LS190N; TI**
IC5000-M5	8-759-901-91	**SN74LS191N; TI**
IC5000-M6	8-759-900-00	**SN74LS00N; TI**
IC5000-M7	8-759-941-20	**SN74120N; TI**
IC5000-M8	8-759-901-64	**SN74LS164N; TI**
IC5000-N1	8-759-902-21	**SN74LS221N; TI**
IC5000-N2	8-759-900-08	**SN74LS08N; TI**
IC5000-N3	8-759-900-11	**SN74LS11N; TI**
IC5000-N4	8-759-901-91	**SN74LS191N; TI**

NOTE:

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Ref. No.	Parts No.	Description
IC5000-N5	8-759-900-20	SN74LS20N; TI
IC5000-N6	8-759-900-04	SN74LS04N; TI
IC5000-N7	8-759-901-09	SN74LS109N; TI
IC5000-N8	8-759-901-09	SN74LS109N; TI
IC5000-01	8-759-902-57	SN74LS257N; TI
IC5000-02	8-759-751-03	MB7051-BV3; P-ROM
IC5000-03	8-759-941-61	SN74161N; TI
IC5000-04	8-759-900-86	SN74LS86N; TI
IC5000-05	8-759-974-25	SN7425N; TI
IC5000-06	8-759-901-91	SN74LS191N; TI
IC5000-07	8-759-901-09	SN74LS109N; TI
IC5000-08	8-759-900-02	SN74LS02N; TI
IC5000-P1	8-759-911-89	SN74S189N; TI
IC5000-P2	8-759-902-51	SN74LS251N; TI
IC5000-P3	8-759-941-60	SN74160N; TI
IC5000-P4	8-759-901-61	SN74160N; TI
IC5000-P5	8-759-901-64	SN74LS164N; TI
IC5000-P6	8-759-900-03	SN74LS03N; TI
IC5000-P7	8-759-900-12	SN74LS12N; TI
IC5000-P8	8-759-941-20	SN74120N; TI
IC5000-Q1	8-759-932-58	3258DC; FSC
IC5000-Q2	8-759-901-07	SN74LS107N; TI
IC5000-Q3	8-759-901-23	SN74LS123N; TI
IC5000-Q4	8-759-941-61	SN74161N; TI
IC5000-Q5	8-759-900-02	SN74LS02N; TI
IC5000-Q6	8-759-900-02	SN74LS20N; TI
IC5000-Q7	8-759-941-61	SN74161N; TI
IC5000-Q8	8-759-900-12	SN74LS12N; TI

VIDO board

Serial No. up to 10040 (USA/CND)
Serial No. up to 10010 (JAPAN)

IC7001	8-759-952-07	SN75207N; TI
IC7004	8-759-374-58	HA17458GS; HITACHI
IC7005	8-759-952-07	SN75207N; TI
IC7006	8-759-374-58	HA17458GS; HITACHI (LM1458N ; NSC)
IC7007	8-759-374-58	HA17458GS: HITACHI (LM1458N; NSC)

Ref. No.	Parts No.	Description
IC7008	8-759-275-06	TA7506M; TOSHIBA (LM301AH; FSC)
IC7009	8-759-145-57	μPC4557C; NEC
IC7010	8-759-145-57	μPC4557C; NEC
IC7011	8-759-952-07	SN75207N; TI
IC7000-A1	8-759-900-00	SN74LS00N; TI
IC7000-A2	8-759-900-04	SN74LS04N; TI
IC7000-A3	8-759-900-14	SN74LS14N; TI
IC7000-A4	8-759-902-59	SN74LS259N; TI
IC7000-B1	8-759-900-02	SN74LS02N; TI
IC7000-B2	8-759-632-06	(SN7406N; TI) M53206P; MITSUBISHI
IC7000-B3	8-759-901-09	SN74LS109N; TI
IC7000-B4	8-759-901-51	SN74LS151N; TI
IC7000-C1	8-759-900-00	SN74LS00N; TI
IC7000-C2	8-759-900-08	SN74LS08N; TI
IC7000-C3	8-759-040-46	MC14046BCP; MOTOROLA
IC7000-C4	8-759-900-10	SN74LS10N; TI
IC7000-D1	8-759-901-09	SN74LS109N; TI
IC7000-D2	8-759-901-23	SN74LS123N; TI
IC7000-D3	8-759-941-61	SN74161N; TI
IC7000-D4	8-759-902-57	SN74LS257N; TI
IC7000-E1	8-759-974-07	SN7407N; TI
IC7000-E2	8-759-902-21	SN74LS221N; TI
IC7000-E3	8-759-941-61	SN74161N; TI
IC7000-E4	8-759-901-90	SN74LS190N; TI
IC7000-F1	8-759-902-21	SN74LS221N; TI
IC7000-F2	8-759-900-04	SN74LS04N; TI
IC7000-F3	8-759-902-21	SN74LS221N; TI
IC7000-F4	8-759-901-07	SN74LS107N; TI
IC7000-G1	8-759-902-21	SN74LS221N; TI
IC7000-G2	8-759-901-09	SN74LS109N; TI
IC7000-G3	8-759-900-08	SN74LS08N; TI
IC7000-G4	8-759-900-11	SN74LS11N; TI
IC7000-H1	8-759-900-86	SN74LS86N; TI
IC7000-H2	8-759-900-32	SN74LS32N; TI

NOTE:

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Ref. No.	Parts No.	Description
IC7003-H3	8-759-632-06	(SN406N; TI) M53206P; MITSUBISHI
IC7000-H4	8-759-900-86	SN74LS86N; TI
IC7000-I2	8-759-900-00	SN74LS00N; TI
IC7000-I3	8-759-900-04	SN74LS04N; TI
IC7000-I4	8-759-632-06	(SN7406N; TI) M53206P; MITSUBISHI
IC7000-J1	8-759-903-24	SN74LS324N; TI
IC7000-J2	8-759-900-02	SN74LS02N; TI
IC7000-J3	8-759-900-04	SN74LS04N; TI
IC7000-J4	8-759-974-07	SN7407N; TI
IC7000-Q37	8-759-143-12	(μA7812UC; FSC) μPC14312H; NEC
IC7000-Q38	8-759-979-12	μA7912UC; FSC

VIDO board

Serial No. 10041 and higher (USA/CND)
Serial No. 10011 and higher (JAPAN)
Serial No. 10001 and higher (AEP)

IC7001	8-759-952-07	SN75207N; TI
IC7002	8-759-374-58	HA17458GS; HITACHI (LM1458N; NSC)
IC7003	8-759-952-07	SN75207N; TI
IC7004	8-759-374-58	HA17458GS; HITACHI (LM1458N; NSC)
IC7005	8-759-374-58	HA17458GS; HITACHI (LM1458N; NSC)
IC7006	8-759-145-57	μPC4557C; NEC
IC7007	8-759-275-06	TA7506M; TOSHIBA (LM301AH; FSC)
IC7008	8-759-145-57	μPC4557C; NEC
IC7009	8-759-972-07	SN75207N; TI
IC7010	8-759-143-12	(μA7812UC; FSC) μPC14312H; NEC
IC7011	8-759-979-12	μA7912UC; FSC
IC7000-A1	8-759-900-14	SN74LS14N; TI
IC7000-A2	8-759-632-06	(SN7406N; TI) M53206P; MITSUBISHI
IC7000-A3	8-759-901-51	SN74LS151N; TI
IC7000-A4	8-759-900-00	SN74LS00N; TI
IC7000-B1	8-759-901-09	SN74LS109N; TI
IC7000-B2	8-759-900-14	SN74LS14N; TI
IC7000-B3	8-759-902-59	SN74LS259AN; TI
IC7000-B4	8-759-900-02	SN74LS02N; TI
IC7000-C1	8-759-901-23	SN74LS123N; TI

Ref. No.	Part No.	Description
IC7000-C2	8-759-900-08	SN74LS08N; TI
IC7000-C3	8-759-900-10	SN74LS10N; TI
IC7000-C4	8-759-974-07	SN7407N; TI
IC7000-D1	8-759-040-46	MC14046BCP; MOTOROLA
IC7000-D2	8-759-900-04	SN74LS04N; TI
IC7000-D3	8-759-900-86	SN74LS86N; TI
IC7000-E1	8-759-941-61	SN74161N; TI
IC7000-E2	8-759-901-09	SN74LS109N; TI
IC7000-E3	8-759-900-00	SN74LS00N; TI
IC7000-E4	8-759-632-06	(SN7406N; TI) M53206P; MITSUBISHI
IC7000-F1	8-759-941-61	SN74161N; TI
IC7000-F2	8-759-900-32	SN74LS32N; TI
IC7000-F3	8-759-900-04	SN74LS04N; TI
IC7000-F4	8-759-900-11	SN74LS11N; TI
IC7000-G1	8-759-901-90	SN74LS190N; TI
IC7000-G2	8-759-902-57	SN74LS257N; TI
IC7000-G3	8-759-900-00	SN74LS00N; TI
IC7000-G4	8-759-900-08	SN74LS08N; TI
IC7000-H1	8-759-901-07	SN74LS107N; TI
IC7000-H2	8-759-902-21	SN74LS221N; TI
IC7000-H3	8-759-900-04	SN74LS04N; TI
IC7000-H4	8-759-632-06	(SN7406N; TI) M53206P; MITSUBISHI
IC7000-I1	8-759-902-21	SN74LS221N; TI
IC7000-I2	8-759-901-09	SN74LS109N; TI
IC7000-I3	8-759-902-21	SN74LS221N; TI
IC7000-I4	8-759-900-86	SN74LS86N; TI
IC7000-J1	8-759-900-02	SN74LS02N; TI
IC7000-J2	8-759-900-10	SN74LS10N; TI
IC7000-J3	8-759-902-21	SN74LS221N; TI
IC7000-J4	8-759-974-07	SN7407N; TI
IC7000-K1	8-759-903-24	SN74LS324N; TI
IC7000-K2	8-759-900-11	SN74LS11N; TI

NOTE:

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Ref. No.	Parts No.	Description	

INDUCTOR

VIDO board

Serial No. up to 10040 (USA/CND)
Serial No. up to 10010 (JAPAN)

L7001	1-407-161-XX	micro	22μH
L7002	1-407-161-XX	micro	22μH
L7003	1-407-163-XX	micro	33μH
L7004	1-407-167-XX	micro	68μH
L7005	1-407-163-XX	micro	33μH
L7006	1-407-163-XX	micro	33μH
L7007	1-407-161-XX	micro	22μH
L7008	1-407-161-XX	micro	22μH
L7009	1-407-161-XX	micro	22μH
L7010	1-407-167-XX	micro	68μH
L7011	1-407-161-XX	micro	22μH
L7012	1-407-161-XX	micro	22μH
L7013	1-407-161-XX	micro	22μH
L7014	1-407-167-XX	micro	68μH
L7015	1-407-161-XX	micro	22μH
L7016	1-407-161-XX	micro	22μH
L7017	1-407-167-XX	micro	68μH
L7018	1-407-161-XX	micro	22μH
L7019	1-407-157-XX	micro	10μH
L7020	1-407-161-XX	micro	22μH

VIDO board

Serial No. 10041 and higher (USA/CND)
Serial No. 10011 and higher (JAPAN)
Serial No. 10001 and higher (AEP)

L7001	1-407-167-XX	micro	68μH
L7002	1-407-161-XX	micro	22μH
L7003	1-407-161-XX	micro	22μH
L7004	1-407-161-XX	micro	22μH
L7005	1-407-161-XX	micro	22μH
L7006	1-407-167-XX	micro	68μH
L7007	1-407-167-XX	micro	68μH
L7008	1-407-161-XX	micro	22μH
L7009	1-407-161-XX	micro	22μH
L7010	1-407-161-XX	micro	22μH
L7011	1-407-161-XX	micro	22μH
L7012	1-407-167-XX	micro	68μH
L7013	1-407-163-XX	micro	33μH
L7014	1-407-163-XX	micro	33μH
L7015	1-407-161-XX	micro	22μH
L7016	1-407-161-XX	micro	22μH
L7017	1-407-161-XX	micro	22μH
L7018	1-407-161-XX	micro	22μH
L7019	1-407-163-XX	micro	33μH
L7020	1-407-157-XX	micro	10μH

MOTOR

frame

⚠M1	1-541-136-00	fan

LAMP

FRNT board

PL2001	1-518-138-XX	5V 60mA
PL2002	1-518-259-00	5V 60mA
PL2003	1-518-259-00	5V 60mA

TRANSISTOR

CONP board

Q1001	8-765-222-20	2SC1963
Q1002	8-765-222-20	2SC1963

FRNT board

Q2001	8-729-468-43	2SA684
Q2002	8-729-468-43	2SA684
Q2003	8-729-468-43	2SA684
Q2004	8-729-468-43	2SA684
Q2005	8-729-468-43	2SA684
Q2006	8-729-468-43	2SA684
Q2007	8-729-468-43	2SA684
Q2008	8-729-468-43	2SA684
Q2009	8-724-375-01	2SC403C
Q2010	8-729-612-77	(2SA678) 2SA1027R
Q2011	8-729-612-77	(2SA678) 2SA1027R
Q2012	8-729-612-77	(2SA678) 2SA1027R
Q2013	8-729-468-43	2SA684
Q2014	8-729-468-43	2SA684

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Ref. No.	Parts No.	Description
REDR board		
Q5001	8-724-375-01	2SC403C
Q5002	8-724-375-01	2SC403C
VIDO board		
Serial No. up to 10040 (USA/CND)		
Serial No. up to 10010 (JAPAN)		
Q7001	8-724-375-01	2SC403C
Q7002	8-724-375-01	2SC403C
Q7003	8-729-612-77	(2SA678) 2SA1027R
Q7004	8-729-612-77	(2SA678) 2SA1027R
Q7005	8-762-020-00	2SA835
Q7006	8-765-020-00	2SA884
Q7008	8-761-200-00	3SK48; MOS
Q7010	8-765-020-00	2SA884
Q7011	8-765-222-20	2SC1963
Q7012	8-765-222-20	2SC1963
Q7013	8-765-020-00	2SA884
Q7015	8-765-020-00	2SA884
Q7018	8-761-200-00	3SK48; MOS
Q7019	8-761-200-00	3SK48; MOS
Q7020	8-765-222-20	2SC1963
Q7021	8-765-020-00	2SA884
Q7022	8-765-020-00	2SA884
Q7023	8-765-222-20	2SC1963
Q7024	8-765-020-00	2SA884
Q7025	8-765-222-20	2SC1963
Q7026	8-765-020-00	2SA884
Q7027	8-765-222-20	2SC1963
Q7029	8-765-020-00	2SA884
Q7030	8-761-200-00	3SK48; MOS
Q7031	8-761-200-00	3SK48; MOS
Q7032	8-761-200-00	3SK48; MOS
Q7033	8-761-200-00	3SK48; MOS
Q7034	8-761-200-00	3SK48; MOS
Q7035	8-761-200-00	3SK48; MOS
Q7036	8-765-222-20	2SC1963
Q7040	8-761-200-00	3SK48; MOS

Ref. No.	Parts No.	Description
VIDO board		
Serial No. 10041 and higher (USA/CND)		
Serial No. 10011 and higher (JAPAN)		
Serial No. 10001 and higher (AEP)		
Q7001	8-729-612-77	(2SA678) 2SA1027R
Q7002	8-765-020-00	2SA884
Q7003	8-761-200-00	3SK48; MOS
Q7004	8-761-200-00	3SK48; MOS
Q7005	8-761-200-00	3SK48; MOS
Q7006	8-765-222-20	2SC1963
Q7007	8-765-020-00	2SA884
Q7008	8-765-222-20	2SC1963
Q7009	8-765-020-00	2SA884
Q7010	8-729-612-77	(2SA678) 2SA1027R
Q7011	8-765-020-00	2SA884
Q7012	8-761-200-00	3SK48; MOS
Q7013	8-761-200-00	3SK48; MOS
Q7014	8-761-200-00	3SK48; MOS
Q7015	8-765-222-20	2SC1963
Q7016	8-765-020-00	2SA884
Q7017	8-765-222-20	2SC1963
Q7018	8-765-020-00	2SA884
Q7019	8-765-020-00	2SA884
Q7020	8-765-222-20	2SC1963
Q7021	8-765-020-00	2SA884
Q7022	8-765-222-20	2SC1963
Q7023	8-761-200-00	3SK48; MOS
Q7024	8-761-200-00	3SK48; MOS
Q7025	8-761-200-00	3SK48; MOS
Q7026	8-765-020-00	2SA884
Q7027	8-765-222-20	2SC1963
Q7028	8-724-375-01	2SC403C
Q7029	8-724-375-01	2SC403C
Q7030	8-761-200-00	3SK48; MOS
Q7031	8-762-020-00	2SA835

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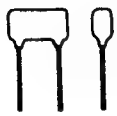
RESISTOR – FIXED

Parts that are not listed in the "reference numbers order list" are shown in following table.
Reference numbers are omitted.

METAL FILM RESISTOR



± 1%, 1/4W
10Ω through 100kΩ

Parts No. 1-214-□□□-00

Value	Parts No. –□□□–
10Ω	084
11	085
12	086
13	087
15	088
16	089
18	090
20	091
22	092
24	093
27	094
30	095
33	096
36	097
39	098
43	099
47	100
51	101
56	102
62	103
68	104
75	105
82	106
91	107

Value	Parts No. –□□□–
100Ω	108
110	109
120	110
130	111
150	112
160	113
180	114
200	115
220	116
240	117
270	118
300	119
330	120
360	121
390	122
430	123
470	124
510	125
560	126
620	127
680	128
750	129
820	130
910	131

Value	Parts No. –□□□–
1.0kΩ	132
1.1	133
1.2	134
1.3	135
1.5	136
1.6	137
1.8	138
2.0	139
2.2	140
2.4	141
2.7	142
3.0	143
3.3	144
3.6	145
3.9	146
4.3	147
4.7	148
5.1	149
5.6	150
6.2	151
6.8	152
7.5	153
8.2	154
9.1	155

Value	Parts No. –□□□–
10kΩ	156
11	157
12	158
13	159
15	160
16	161
18	162
20	163
22	164
24	165
27	166
30	167
33	168
36	169
39	170
43	171
47	172
51	173
56	174
62	175
68	176
75	177
82	178
91	179
100	180

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Ref. No.	Parts No.	Description			
FRNT board					
R2037	1-212-505-00	metal	68	1%	½W
GENR board					
R3001	1-246-455-00	carbon	180	5%	¼W
R3002	1-246-473-00	carbon	1K	5%	¼W
R3003	1-246-477-00	carbon	1.5K	5%	¼W
R3004	1-246-477-00	carbon	1.5K	5%	¼W
R3005	1-246-477-00	carbon	1.5K	5%	¼W
R3006	1-246-489-00	carbon	4.7K	5%	¼W
R3007	1-246-497-00	carbon	10K	5%	¼W
R3008	1-246-517-00	carbon	68K	5%	¼W
R3009	1-246-495-00	carbon	8.2K	5%	¼W
R3010	1-246-541-00	carbon	680K	5%	¼W
R3011	1-246-514-00	carbon	51K	5%	¼W
R3012	1-246-457-00	carbon	220	5%	¼W
R3013	1-246-489-00	carbon	4.7K	5%	¼W
R3014	1-246-497-00	carbon	10K	5%	¼W
R3015	1-246-495-00	carbon	8.2K	5%	¼W
R3016	1-246-539-00	carbon	560K	5%	¼W
MHRB board					
R4001	1-246-483-00	carbon	2.7K	5%	¼W
REDR board					
R5039	1-246-457-00	carbon	220	5%	¼W
R5040	1-246-489-00	carbon	4.7K	5%	¼W
R5041	1-246-489-00	carbon	4.7K	5%	¼W
R5042	1-246-457-00	carbon	220	5%	¼W
R5045	1-246-489-00	carbon	4.7K	5%	¼W
VIDO board					
Serial No. up to 10040 (USA/CND)					
Serial No. up to 10010 (JAPAN)					
R7089	1-246-524-00	carbon	130K	5%	¼W
R7126	1-246-542-00	carbon	750K	5%	¼W
R7152	1-246-542-00	carbon	750K	5%	¼W
R7227	1-246-530-00	carbon	240K	5%	¼W
R7230	1-246-530-00	carbon	240K	5%	¼W

NOTE:

1. The shaded and ⚠ -marked components are critical to safety.
   Replace only with same component as specified.
2. Parts printed in **Bold-Face type** are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.

Ref. No.	Parts No.	Description			
VIDO board					
Serial No. 10041 and higher (USA/CND)					
Serial No. 10011 and higher (JAPAN)					
Serial No. 10001 and higher (AEP)					
R7005	1-246-542-00	carbon	750K	5%	¼W
R7042	1-246-530-00	carbon	240K	5%	¼W
R7214	1-246-524-00	carbon	130K	5%	¼W
R7239	1-246-530-00	carbon	240K	5%	¼W

RESISTOR – BLOCK

FRNT board				
RB2001	1-231-385-00	4.7K, 8 pcs,	10%	⅛W
RB2002	1-231-385-00	4.7K, 8 pcs,	10%	⅛W
RB2003	1-231-385-00	4.7K, 8 pcs,	10%	⅛W
RB2004	1-231-385-00	4.7K, 8 pcs,	10%	⅛W
RB2005	1-231-385-00	4.7K, 8 pcs,	10%	⅛W
RB2006	1-231-385-00	4.7K, 8 pcs,	10%	⅛W
RB2007	1-231-385-00	4.7K, 8 pcs,	10%	⅛W
RB2008	1-231-384-00	2K, 8 pcs,	10%	⅛W
GENR board				
RB3001	1-231-385-00	4.7K, 8 pcs,	10%	⅛W
RB3002	1-231-385-00	4.7K, 8 pcs,	10%	⅛W
RB3003	1-231-384-00	2K, 8 pcs,	10%	⅛W
RB3004	1-231-385-00	4.7K, 8 pcs,	10%	⅛W
RB3005	1-231-385-00	4.7K, 8 pcs,	10%	⅛W
RB3006	1-231-385-00	4.7K, 8 pcs,	10%	⅛W
RB3007	1-231-385-00	4.7K, 8 pcs,	10%	⅛W
REDR board				
RB5001	1-231-385-00	4.7K, 8 pcs,	10%	⅛W
RB5002	1-231-385-00	4.7K, 8 pcs,	10%	⅛W

RELAY

CONP board		
RY1001	1-515-309-00	5V 200Ω (DX2-5V)
RY1002	1-515-309-00	5V 200Ω (DX2-5V)

Ref. No.	Parts No.	Description
SWITCH		
frame		
⚠S1	1-516-379-00	toggle; POWER
CONP board		
S1001	1-552-078-00	slide; 75Ω ON/OFF
S1002	1-552-078-00	slide; 75Ω ON/OFF
S1003	1-552-078-00	slide; 75Ω ON/OFF
FRNT board		
S2001	1-516-441-00	lever slide, generator/reder select
S2002	1-516-441-00	lever slide, time/U-BIT select
S2003	1-552-061-00	lever slide, DISPLAY HOLD
S2004	1-552-061-00	lever slide, GENERATOR RESET
S2005 (S2006) (S2007) (S2008)	1-552-538-00	push, 4-key, SOURCE select
S2009	1-516-441-00	lever slide, REF select
S2010	1-516-441-00	lever slide, VITC ON/OFF
S2011	1-516-441-00	lever slide, DROP FRAME ON/OFF
S2012	1-516-995-00	lever slide, U-BIT select
S2013	1-516-441-00	lever slide, CHARACTER ON/OFF
S2014	1-516-441-00	lever slide, ERROR BYPASS ON/OFF
S2015	1-516-995-00	lever slide, VITC select
S2016 (S2017) (S2018)	1-552-537-00	push, 3-key, INPUT SELECT
S2019	1-552-101-00	lever slide, REMOTE ON/OFF
S2020	1-552-380-00	key, GENERATOR SET
S2021	1-552-380-00	key, GENERATOR SET
S2022	1-552-380-00	key, GENERATOR SET
S2023	1-552-380-00	key, GENERATOR SET
S2024	1-552-380-00	key, GENERATOR SET
S2025	1-552-380-00	key, GENERATOR SET
S2026	1-552-380-00	key, GENERATOR SET
S2027	1-552-380-00	key, GENERATOR SET

Ref. No.	Parts No.	Description
GENR board		
S3001	1-552-480-00	rotary, hexadecimal
S3002	1-552-480-00	rotary, hexadecimal
S3003	1-552-101-00	lever slide
REDR board		
S5001	1-552-101-00	lever slide
S5002	1-552-480-00	rotary, hexadecimal
S5003	1-552-480-00	rotary, hexadecimal
S5004	1-552-101-00	lever slide
VIDO board		
S7001	1-552-096-00	lever slide
S7002	1-552-101-00	lever slide
S7003	1-552-101-00	lever slide
S7004	1-552-101-00	lever slide

TRANSFORMER

frame		
⚠T1	1-446-107-00	power
TRNS board		
T6001	1-423-226-00	input/output
T6002	1-423-226-00	input/output
T6003	1-423-226-00	input/output
T6004	1-423-226-00	input/output

NOTE:

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   Replace only with same component as specified.
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Ref. No.	Parts No.	Description	

RESISTOR – VARIABLE

GENR board

VR3001	1-224-939-00	metal	5K(B)
VR3002	1-224-940-00	metal	10K(B)

REDR board

VR5001	1-224-949-00	metal	5K(B)
VR5002	1-224-952-00	metal	50K(B)

VIDO board

Serial No. up to 10040 (USA/CND)
Serial No. up to 10010 (JAPAN)

VR7001	1-224-940-00	metal	10K(B)
VR7002	1-224-978-00	metal	50(B)
VR7003	1-224-978-00	metal	50(B)
VR7004	1-224-936-00	metal	500(B)
VR7005	1-224-936-00	metal	500(B)
VR7006	1-224-937-00	metal	1K(B)
VR7007	1-224-940-00	metal	10K(B)
VR7008	1-224-940-00	metal	10K(B)
VR7009	1-224-940-00	metal	10K(B)
VR7010	1-224-978-00	metal	50(B)
VR7011	1-224-978-00	metal	50(B)
VR7012	1-224-936-00	metal	500(B)
VR7013	1-224-936-00	metal	500(B)
VR7014	1-224-978-00	metal	50(B)
VR7015	1-224-978-00	metal	50(B)
VR7016	1-224-943-00	metal	100K(B)
VR7017	1-224-943-00	metal	100K(B)
VR7018	1-224-942-00	metal	50K(B)
VR7019	1-224-942-00	metal	50K(B)

VIDO board

Serial No. 10041 and higher (USA/CND)
Serial No. 10011 and higher (JAPAN)
Serial No. 10011 and higher (AEP)

VR7001	1-224-942-00	metal	50K(B)
VR7002	1-224-978-00	metal	50(B)
VR7003	1-224-978-00	metal	50(B)
VR7004	1-224-936-00	metal	500(B)
VR7005	1-224-942-00	metal	50K(B)
VR7006	1-224-978-00	metal	50(B)
VR7007	1-224-978-00	metal	50(B)
VR7008	1-224-936-00	metal	500(B)
VR7009	1-224-936-00	metal	500(B)
VR7010	1-224-937-00	metal	1K(B)
VR7011	1-224-936-00	metal	500(B)
VR7012	1-224-978-00	metal	50(B)
VR7013	1-224-978-00	metal	50(B)
VR7014	1-224-940-00	metal	10K(B)
VR7015	1-224-940-00	metal	10K(B)
VR7016	1-224-940-00	metal	10K(B)
VR7017	1-224-940-00	metal	10K(B)
VR7018	1-224-943-00	metal	100K(B)
VR7019	1-224-943-00	metal	100K(B)

XTAL

REDR board

X5001	1-527-227-00	14.31818MHz

MISCELLANEOUS

frame

⚠1-421-326-00	filter, noise
⚠1-509-385-00	voltage selector
1-509-437-00	socket, power transistor; for power reg IC
⚠1-533-142-00	holder, fuse (USA/CND, J)
⚠1-533-148-00	holder, fuse (AEP)
⚠1-534-142-XX	AC cord (J)
⚠1-534-692-00	AC cord (USA/CND)
⚠1-534-820-XX	AC cord (AEP)
1-536-278-XX	terminal, 5P

NOTE:

1. The shaded and ⚠-marked components are critical to safety.
   Replace only with same component as specified.
2. Parts printed in Bold-Face type are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.

5-4. PACKING MATERIAL AND ACCESSORY (SUPPLIED)

Ref. No.	Parts No.	Description
	A-6265-016-A	**Extension Card**
R1	**1-246-457-00**	**Resistor, carbon 220 5% ¼W**
R2, 3	**1-246-478-00**	**Resistor, carbon 1.6K 5% ¼W**
CN1	1-560-054-00	Receptacle, female, 50P
D1, 2, 3	**8-719-801-02**	**Diode TLR102, LED, red**
	⚠1-532-268-XX	**Fuse 2A (USA/CND)**
	⚠1-532-363-XX	**Fuse 2A (J)**
	⚠1-532-078-00	**Fuse T1A (AEP)**
	2-249-302-00	Angle, rack
	2-249-305-00	Cover
	2-249-307-00	Indicator, remote
	2-252-602-00	Carton, individual
	2-252-603-00	Cushion (B)
	2-252-604-00	Cushion (C)
	2-252-605-00	Cushion (D)
	2-252-627-00	Cushion (A)
	3-701-616-00	**Bag, poly (for Fuse)**
	3-701-630-00	**Bag, poly (for Manual)**
	3-701-640-00	**Bag, poly (for BVG-1000)**

NOTE:

1. **The shaded and ⚠ -marked components are critical to safety.**
   Replace only with same component as specified.
2. Parts printed in **Bold-Face** type are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.

SONY

TIME CODE GENERATOR/READER

BVG-1000

SUPPLEMENT-4 (Revised 1)

SUBJECT

1. VITC FORMAT CHANGE – BVG-KIT 1 –
2. CUE TIME CODE RISE/FALL TIME CHANGE – for European Model Only –

EFFECTIVE SERIAL NUMBER

USA/CND	#10001 to #11200;	not modified at factory
	#21201 & up;	modified at factory
Europe	#10001 to #10200;	not modified at factory
	#20201 & up;	modified at factory

内容

1. VITC フォーマット変更 ―BVG-KIT 1―
2. CUE TIME CODE 立上り/立下り時間変更 ―ヨーロッパ向のみ―

対象機番

JAPAN	#10001～#10700；	工場では実施せず
	#20701以降；	工場で実施済

OPERATION AND MAINTENANCE MANUAL

9-966-448-86

Sony Corporation

1981.9 0906 1-5

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1. GENERAL DESCRIPTION

1-1. VITC FORMAT CHANGE

1-1-1. VITC Insertion Line Select Method Change

In the BVG-1000 before modification, the VITC signal could be inserted on the continuous lines between line 10 and line 25 for an NTSC signal (i.e. between line 7 and line 22 and between line 319 and line 334 for a PAL or SECAM signal) and **Sony recommended to insert the VITC signal on the three lines of lines 12, 13 and 14 for NTSC signals.** An operator or installer could determine the start line and how many lines for the VITC signal to be inserted, using POSITION and WIDTH switches on GENERATOR circuit board.

Start Line; POSITION switch on GENERATOR board
How many Lines; WIDTH switch on GENERATOR board

In the BVG-1000 to which BVG-KIT-1 is applied, the method is changed as follows.

The VITC signal can be inserted on the one or two lines separately between line 10 and line 25 and **Sony recommends to insert the VITC signal on line 12 and line 14 for NTSC signals.** Each of POSITION and WIDTH switches on GENERATOR board independently specifies the one line for the VITC signal to be inserted.

Note: When inserting VITC on the one line only, employ either one method of the following "A" or "B".
A; Set WIDTH switch to position "0" and set POSITION switch to the position corresponding to the required line.
B; Set the both switches to same position.

SW	Start Line (POSITION sw)	How Many Lines (WIDTH sw)
0	line 10 (7,319)	0
	11 (8,320)	1
2	12 (9,321)	2
	13 (10,322)	3
4	14 (11,323)	4
	15 (12,324)	5
6	16 (13,325)	6
	17 (14,326)	7
8	18 (15,327)	8
	19 (16,328)	9
A	20 (17,329)	10
	21 (18,330)	11
C	22 (19,331)	12
	23 (20,332)	13
E	24 (21,333)	14
	25 (22,334)	15
0	10 (7,319)	0

( ); The number in brackets is the line number that is defined in PAL or SECAM system.

SW	VITC Insertion Line No.	
	POSITION sw	WIDTH sw
0	line 10 (7,319)	none
	11 (8,320)	line 11 (8,320)
2	12 (9,321)	12 (9,321)
	13 (10,322)	13 (10,322)
4	14 (11,323)	14 (11,323)
	15 (12,324)	15 (12,324)
6	16 (13,325)	16 (13,325)
	17 (14,326)	17 (14,326)
8	18 (15,327)	18 (15,327)
	19 (16,328)	19 (16,328)
A	20 (17,329)	20 (17,329)
	21 (18,330)	21 (18,330)
C	22 (19,331)	22 (19,331)
	23 (20,332)	23 (20,332)
E	24 (21,333)	24 (21,333)
	25 (22,334)	25 (22,334)
0	10 (7,319)	none

1-1-2. VITC Level Change

The level of the inserted VITC signal is changed as follows.
50 IRE units ——→ 80 IRE units

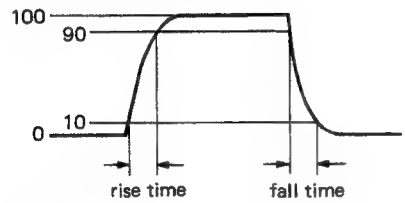
1-1-3. VITC Field Mark Bit Change

The bit 15 and bit 35 of bit 0 to 89 included in VITC signal are changed as follows.

Bit 15; Field Mark ——→ Color Frame Flag
field 1, 3; zero — always zero in BVG-1000
field 2, 4; one

Bit 35; Unassigned Bit ——→ Field Mark
field 1, 3; zero
field 2, 4; one

1-2. CUE TIME CODE RISE/FALL TIME CHANGE – for European Model Only –



USA/CND; 25μSec ——→ not changed
Europe; 25μSec ——→ 50μSec

2. CAUTION FOR OPERATOR/ INSTALLER

2-1. NUMERICAL DISPLAY

When reading the old format VITC with the modified BVG-1000, pay attention to the following.

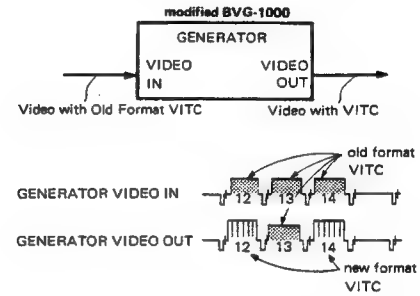
The modified BVG-1000 may not read correctly the old format VITC due to the VITC level difference; as a result, the numerical display may flicker. In that case, attempt to increase the BVG-1000 video input level.

When the modified BVG-1000 reads the old format VITC, the field marking LED, that is the numerical display's rightmost LED, does not light.

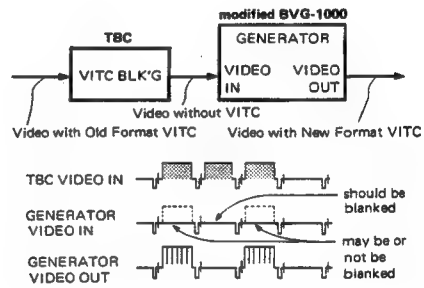
2-2. VITC SIGNAL REPLACEMENT

When a video signal is inputted to GENERATOR VIDEO IN connector, the generator video output carries the VITC signal that is generated by BVG-1000. However, the following should be remembered.

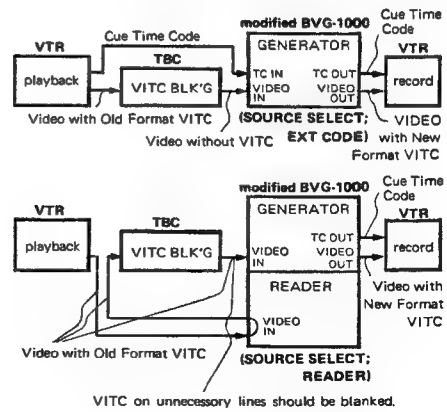
When the generator video input carries a VITC signal, its VITC inserted lines should be same as the lines that is specified by POSITION and WIDTH switches on the BVG-1000 GENERATOR board. If a VITC signal exists on the other lines than the specified lines, the specified lines only are replaced with the newly generated VITC signal but on the other lines the input signal is left.



In that case, blank out the VITC inserted lines of the video signal using a TBC, Sony BVT-2000 for example, before inputted to GENERATOR.



This technic can be applied to replace the old format VITC signal that is recorded on video tape with new format signal.



1. 概要

1-1. VITCフォーマット変更

1-1-1. VITC挿入ライン指定方法変更

当改造を施す前のBVG-1000に於てはVITC信号はNTSC信号では10ラインから25ラインの間(PAL, SECAMでは7ラインから22ラインの間および319ラインから334ラインの間)に連続して挿入することができ，**NTSC信号の場合には12, 13, 14の3つのラインに挿入することを推奨してきた。**BVG-1000のGENERATOR基板上のPOSITION, WIDTHの2つのスイッチによりVITCを挿入する最初のライン№と挿入するべきラインの数とを指定していた。

スタートライン；POSITIONスイッチ
挿入ラインの数；WIDTHスイッチ

BVG-KIT 1により改造されたBVG-1000ではその手順は下記のように変る。

VITC信号は10ラインから25ラインの間の1つ又は2つのラインに別々に挿入できる。**NTSC信号の場合には12と14の2つのラインに挿入することを推奨する。**ジェネレータ基板上のPOSITION, WIDTHの2つのスイッチはVITCの挿入ラインをそれぞれ独立して1ラインずつ指定する。

(注) VITCを1つのラインのみに挿入する場合には下記A, Bのいずれかの方法による。

A；WIDTHスイッチを0にし，POSITIONスイッチで所要のラインを指定する。

B；WIDTH, POSITIONの2つのスイッチを同じ位置にセットする。

SW	スタートライン (POSITION sw)	挿入ライン数 (WIDTH sw)
0	line 10 (7,319)	0
	11 (8,320)	1
2	12 (9,321)	2
	13 (10,322)	3
4	14 (11,323)	4
	15 (12,324)	5
6	16 (13,325)	6
	17 (14,326)	7
8	18 (15,327)	8
	19 (16,328)	9
A	20 (17,329)	10
	21 (18,330)	11
C	22 (19,331)	12
	23 (20,332)	13
E	24 (21,333)	14
	25 (22,334)	15
0	10 (7,319)	0

( )；カッコ内はPAL, SECAMで定義されたライン№

SW	VITC 挿入ライン No.	
	POSITION sw	WIDTH sw
0	line 10 (7,319)	なし
	11 (8,320)	line 11 (8,320)
2	12 (9,321)	12 (9,321)
	13 (10,322)	13 (10,322)
4	14 (11,323)	14 (11,323)
	15 (12,324)	15 (12,324)
6	16 (13,325)	16 (13,325)
	17 (14,326)	17 (14,326)
8	18 (15,327)	18 (15,327)
	19 (16,328)	19 (16,328)
A	20 (17,329)	20 (17,329)
	21 (18,330)	21 (18,330)
C	22 (19,331)	22 (19,331)
	23 (20,332)	23 (20,332)
E	24 (21,333)	24 (21,333)
	25 (22,334)	25 (22,334)
0	10 (7,319)	なし

1-1-2. VITC レベル変更

挿入されるVITC信号のレベルを下記のように変更する。

50IRE ⟶ 80IRE

1-1-3. VITC FIELD MARK ビット変更

VITC信号中のビット0からビット89の間のビット15とビット35を下記のように変更する。

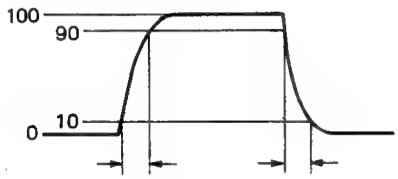
ビット15；

FIELD MARK ⟶ COLOR FRAME FLAG
フィールド1，3；ゼロ　BVG-1000では常にゼロ
フィールド2，4；1

ビット35；

未使用 ⟶ FIELD MARK
フィールド1，3；ゼロ
フィールド2，4；1

1-2. CUE タイムコード立上り/立下り時間変更
—ヨーロッパ向けのみ—



日本/北米；25μSEC ⟶ 変更せず
ヨーロッパ；25μSEC ⟶ 50μSEC

2. 取扱い上の注意

2-1. NUMERICAL DISPLAY

改造後のBVG-1000で旧フォーマットのVITCを読む時は下記の点に注意すること。

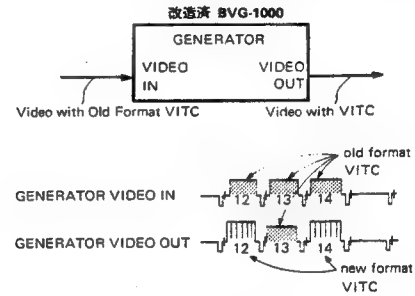
VITCレベルが変更されたため，新BVG-1000は旧VITCを正しく読み取れないことがある。その場合にはBVG-1000へのビデオ入力レベルを増してみる。

FIELD MARK LED（数字表示部の右端にあるLED）は点灯しない。

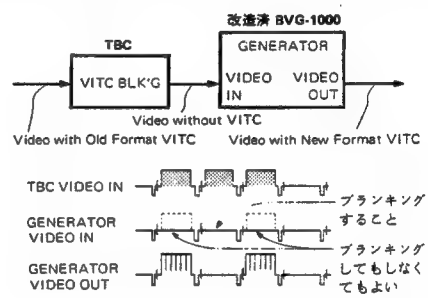
2-2. VITC信号の置き換え

BVG-1000のジェネレータVIDEO INコネクタにビデオ信号を入力するとジェネレータビデオ出力には，BVG-1000内部で作られたVITCを付加することができるが下記の点に留意すること。

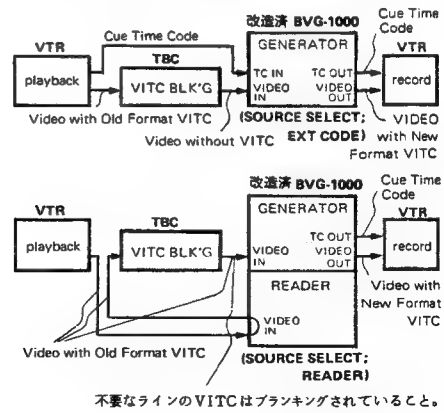
ジェネレータビデオ入力信号に既にVITCが付加されている場合，VITCが挿入されているラインはBVG-1000のPOSITION，WIDTHの2つのスイッチで指定されるラインと一致していること。BVG-1000で指定されたラインと異なったラインにVITCが存在している場合にはジェネレータビデオ出力信号にはBVG-1000で指定されたラインのみがBVG-1000で新たに作られたVITCに置き換えられ，その他のラインには入力信号のVITC信号が残される。



その場合にはTBC（例BVT-2000）を使ってジェネレータに入力する前のビデオ信号中のVITCをブランキングするとよい。



このテクニックを使って旧フォーマットのVITCが記録されたビデオテープを新フォーマットVITCに置き換えることができる。



3. REQUIRED PARTS
改造用部品

BVG-KIT1 involves all of the following parts except the two capacitors that are the VIDEO board modification parts to change the cue time code rise/fall time of European model.

ヨーロッパ向けのCUEタイムコード立上り/立下り時間変更用のコンデンサ2ケ（VIDEO基板）以外の部品はすべてBVG-KIT1に含まれている。

READER (REDR) BOARD

Ref. No.	Part No.	Description	Q'ty
	2-252-672-00	INSULATOR, FIBER	1
	4-847-004-00	SPACER, DIA3x5	1
	7-621-912-60	SCREW, B2.6x12	1
	7-622-207-05	NUT, M2.6	1
	7-688-002-11	WASHER, DIA2.6	1
	-----	JUMPER, ORANGE 20mm	1
	-----	COMPLETE PCB, RO	1

Note: Complete PCB "RO" is composed of the following components.

	1-603-912-00	PCB, RO (without components)
C101	1-161-055-00	CAP, CERAMIC 0.022 50V
IC101	8-759-901-38	IC, SN74LS138N, TTL; TI
IC102	8-759-900-11	IC, SN74LS11N, TTL; TI
	-----	JUMPERS & WIRES

Note: Order number of READER board is changed as follows.
not modified REDR board A-6259-048-B ⟶ modified REDR board A-6259-048-C

GENERATOR (GENR) BOARD

	2-252-672-00	INSULATOR, FIBER	1
	4-847-044-00	SPACER, DIA3x5	1
	7-621-912-60	SCREW, B2.6x12	1
	7-622-207-05	NUT, M2.6x12	1
	7-688-022-11	WASHER, DIA2.6	1
	-----	JUMPER, ORANGE 45mm	2
	-----	JUMPER, ORANGE 55mm	1
	-----	JUMPER, ORANGE 85mm	1
	-----	COMPLETE PCB, GO	1

Note: Complete PCB "GO" is composed of the following components.

	1-603-911-00	PCB, GO (without components)
C101	1-161-055-00	CAP, CERAMIC 0.022 50V
IC101	8-759-941-20	IC, SN74120N, TTL; TI
IC102	8-759-900-20	IC, SN74LS20N, TTL; TI
	-----	JUMPERS & WIRES

Note: Order number of GENERATOR board is changed as follows.
not modified GENR board A-6259-047-A ⟶ modified GENR board A-6259-047-B

VIDEO (VIDO) BOARD

for board No. 1-587-451-11
for board No. 1-587-451-12

Ref. No.	Ref. No.	Part No.	Description	Q'ty
R180 R55	R15 R75	1-214-143-00	RES, METAL 3K 1/4W 1%	2
R199 R129 R57	R54 R113 R250	1-214-131-00	RES, METAL 910 1/4W 1%	3

Note: At factory the following two variable resistors are also changed, however at service field the change is unnecessory.

工場では下記の可変抵抗2個も変更した。但し，フィールドでは変更する必要はない。

VR19	VR1	1-224-942-00 50K ⟶1-224-941-00	RES, VAR, METAL 20K
VR18	VR5	1-224-942-00 50K ⟶1-224-941-00	RES, VAR, METAL 20K

European model requires the following two capacitors also but they are not involved in BVG-KIT1.

ヨーロッパ向けには下記のコンデンサ2点も必要。但し，BVG-KIT1には含まれていない。

C62 C85	C109 C110	1-108-565-00	CAP, MYLAR 0.0027 5% 50V	2

Note: Order number of VIDEO board for European model is changed as follows.

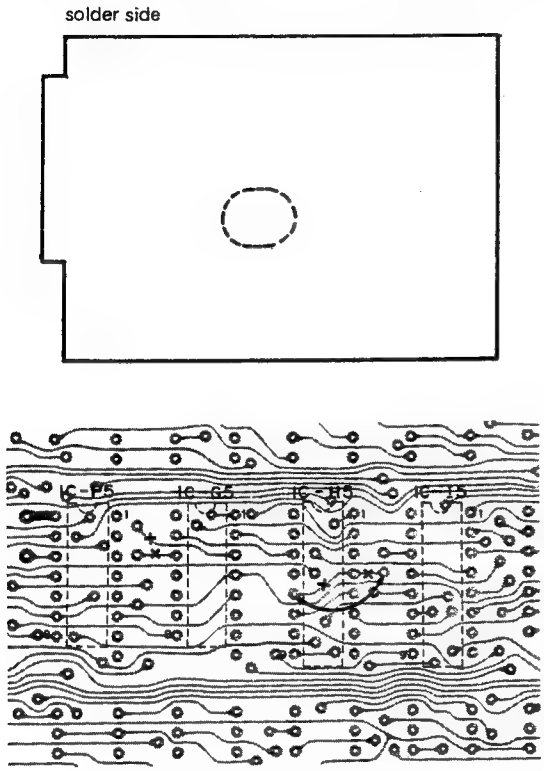
not modified VIDEO board A-6257-024-A ⟶ for USA/CND; not changed
⟶ for Europe; A-6257-086-A

4. MODIFICATION PROCEDURE
改造方法

4-1. READER (REDR) BOARD
– Board No. 1-587-453-11, -12 or -13 –

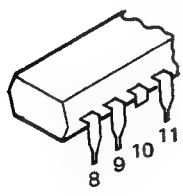
1. Break the foil at four points marked by X and add one jumper.

× 印の4ケ所のパターンを切り，ジャンパー線1本を追加する。



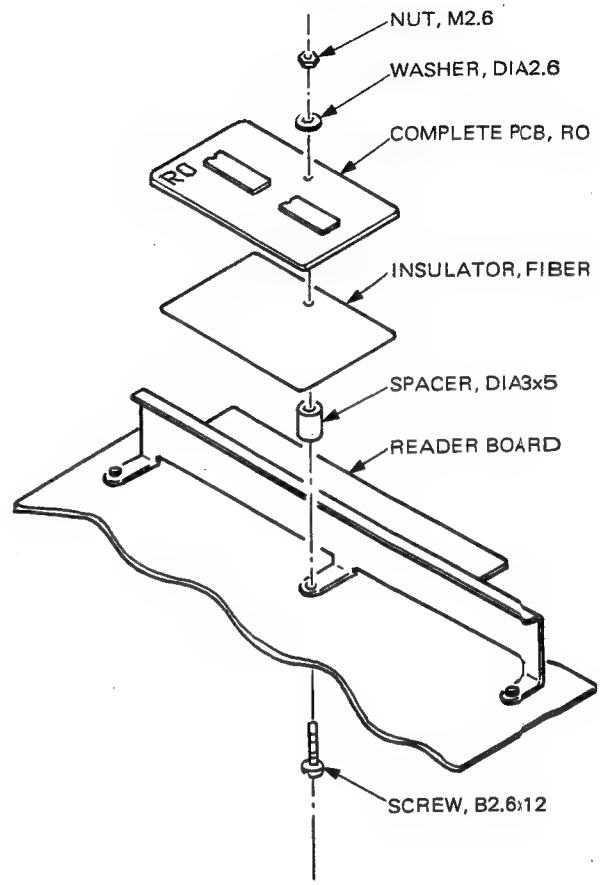
2. Cut the lead of IC-G5 pin 10.

IC-G5の10番ピンを切る。



3. Install the complete PCB "RO" on the component side of READER board.

READER基板の部品面にRO基板を取り付ける。



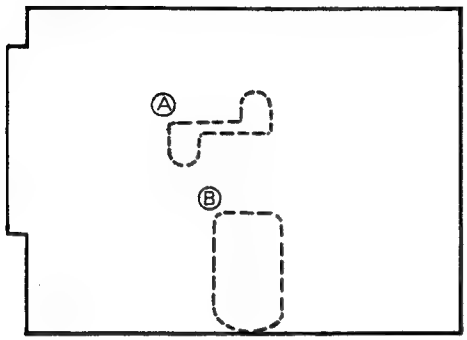
4. Solder thirteen wires, that go out of RO board, to READER board. The blue colored wire, that goes out of RO board "66", should be soldered to IC-G5, pin 10 directly. See the next page.

RO基板から出ている13本の線材をREADER基板に半田付する。RO基板「66」から出ている青線はIC-G5の10番ピンに直接半田付すること。次頁参照。

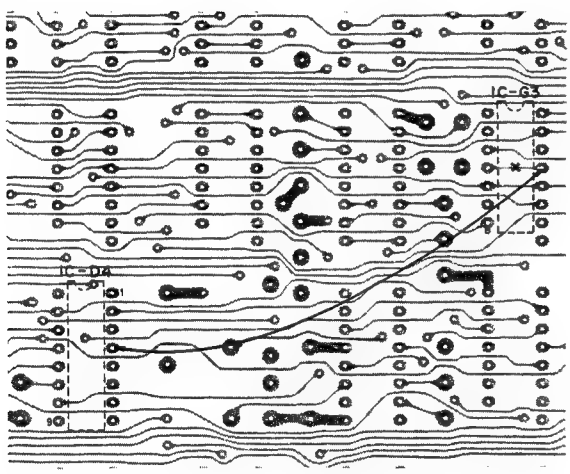
4-2. GENERATOR (GENR) BOARD
– Board No. 1-587-452-11 or -12 –

1. Break the foil at one point marked by X and add four jumpers.
×印の1ケ所のパターンを切り，ジャンパー線4本を追加する。

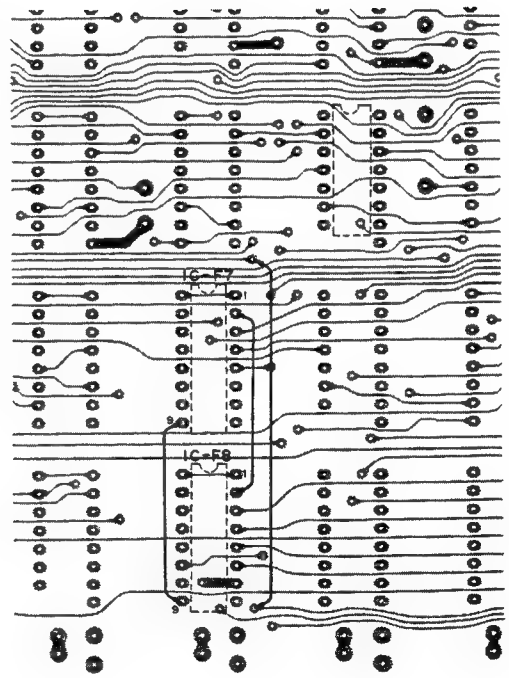
solder side



Ⓐ



Ⓑ

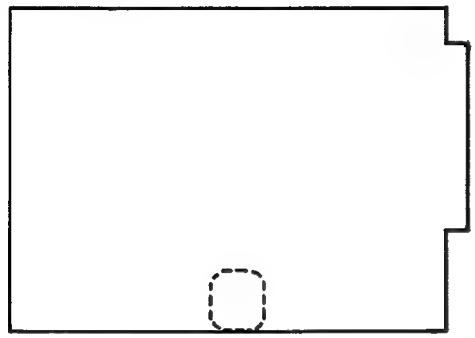


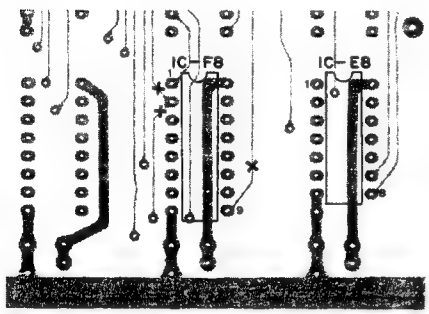
(GENERATOR BOARD, CONTINUED)

2. Break the foil at three points marked by X.

×印の３ケ所のパターンを切る。

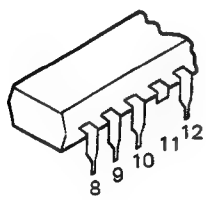
component side





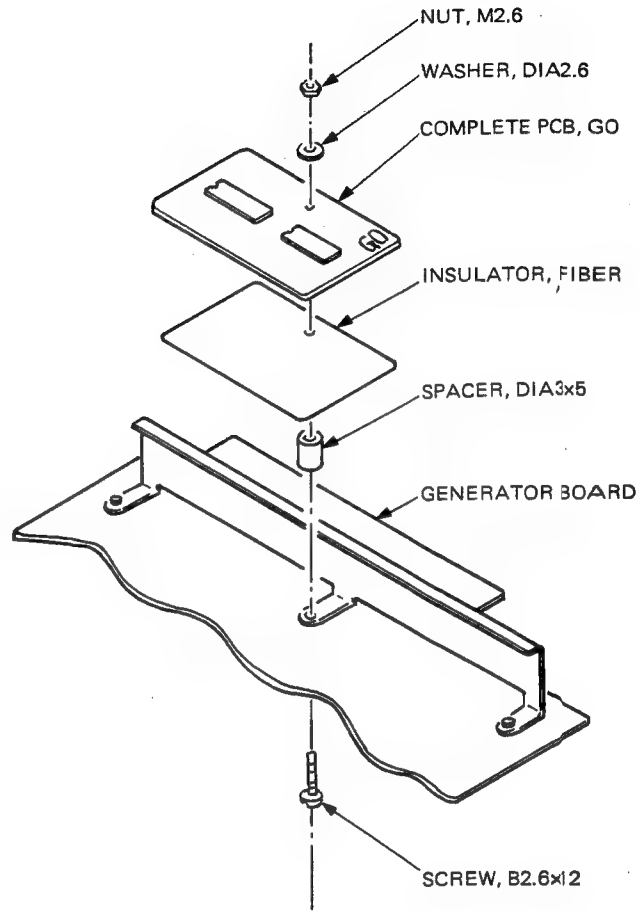
3. Cut the lead of IC-G6 pin 11.

IC-G6の11番ピンを切る。



4. Install the complete PCB "GO" on the component side of GENERATOR board.

GENERATOR基板の部品面にGO基板を取付ける。



5. Solder ten wires, that go out of GO board, to GENERATOR board. See page 8.

GO基板から出ている10本の線材をGENERATOR基板に半田付する。８頁参照。

4-3. VIDEO (VIDO) BOARD
– Board No. 1-587-451-11 or -12 –

1. Replace the five resistors as shown below.

Note: There two types of VIDEO board as follows. Since the reference number of components to be replaced is different between them, take care not to mistake.
Board No. 1-587-451-11
1-587-451-12

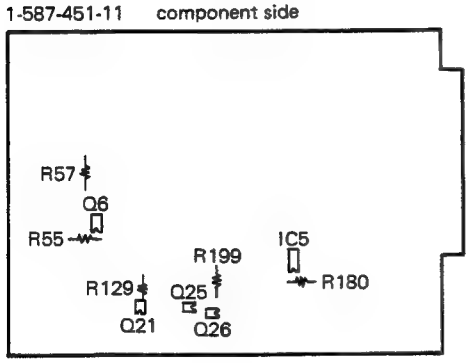
下記の抵抗5個を交換する。

VIDEO基板は下記のように2種類あり，交換するべき部品のリファレンスNo.が異なるので間違えないよう気をつけること。
基板No. 1-587-451-11
1-587-451-12

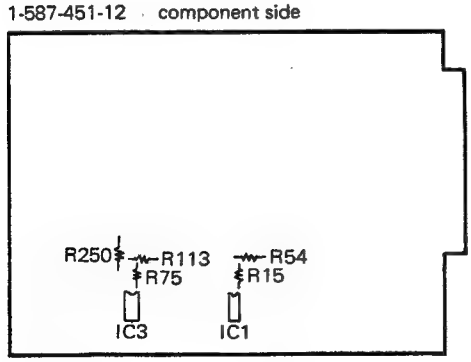
Board No. 1-587-451-11 / Board No. 1-587-451-12

R180	R15	16K → 3K
R55	R75	16K → 3K
R199	R54	1.3K → 910
R129	R113	1.3K → 910
R57	R250	1.3K → 910

1-587-451-11 component side



1-587-451-12 component side



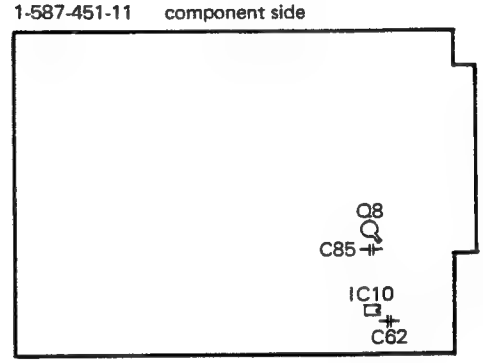
2. For European model, replace the two capacitors also as shown below.

ヨーロッパ向けモデルについては下記のコンデンサ2個も交換する。

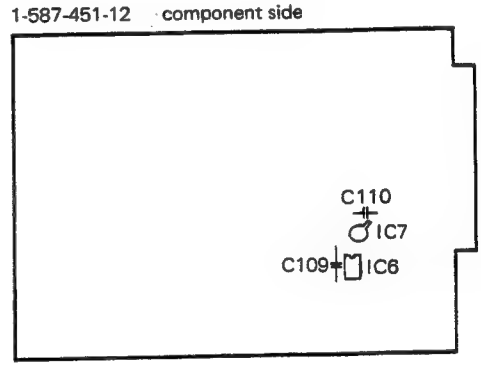
Board No. 1-587-451-11 / Board No. 1-587-451-12

C62	C109	0.001 → 0.0027
C85	C110	0.001 → 0.0027

1-587-451-11 component side



1-587-451-12 component side



4-4. ADJUSTMENTS

After completing the modification, perform the following adjustments according to the procedure that is attached to this supplement.

改造後，当サプリメントに添付された調整要項に従って下記の調整を行なう。

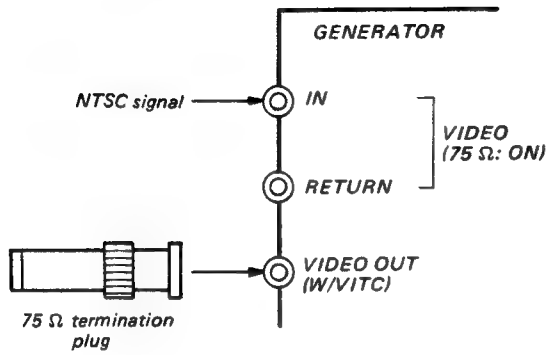
4-4-7. VITC Output Level (GENERATOR) Adj.
4-4-8. VITC Input Slice Level (GENERATOR) Adj.
4-4-11. VITC Output Level (READER: W/VITC)
4-4-12. VITC Input Slice Level (READER)

4-4-7. VITC Output Level (GENERATOR) Adjustment

VIDEO Board; No. 1-587-451-11

Preparation; Connection:

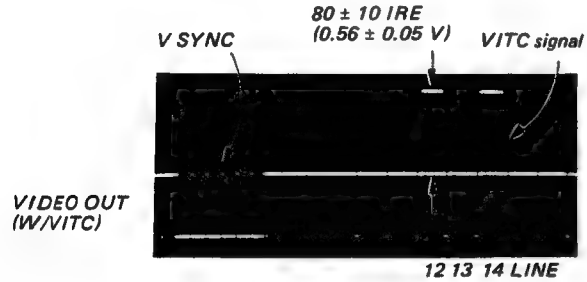
BVG-1000

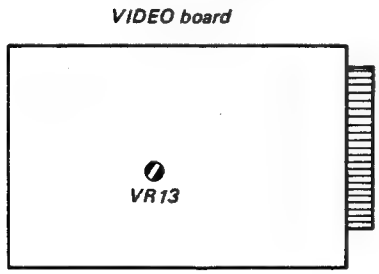


Front Panel
REF select switch: VIDEO
VITC ON/OFF switch: ON
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

Equipment; Oscilloscope
EXT TRIG: IC-B2, pin 6/VIDEO board

Spec. and Adj.; VIDEO board
VR13

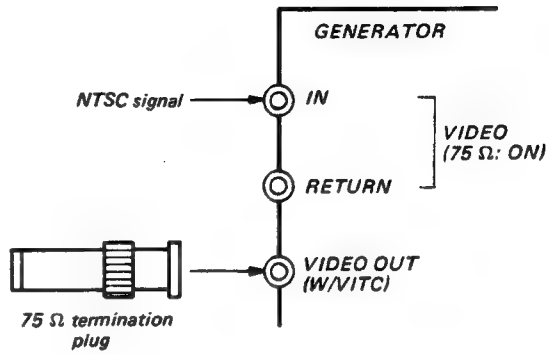




VIDEO Board; No. 1-587-451-12

Preparation; Connection:

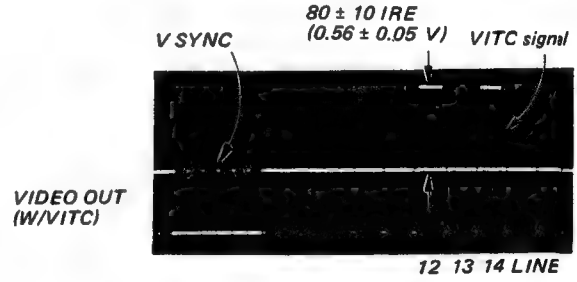
BVG-1000

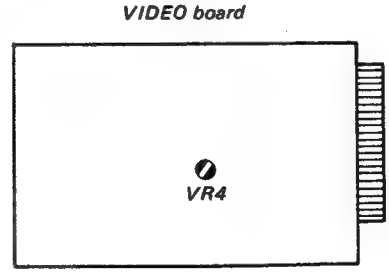


Front Panel
REF select switch: VIDEO
VITC ON/OFF switch: ON
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

Equipment; Oscilloscope
EXT TRIG: IC-A2, pin 6/VIDEO board

Spec. and Adj.; VIDEO board
VR4



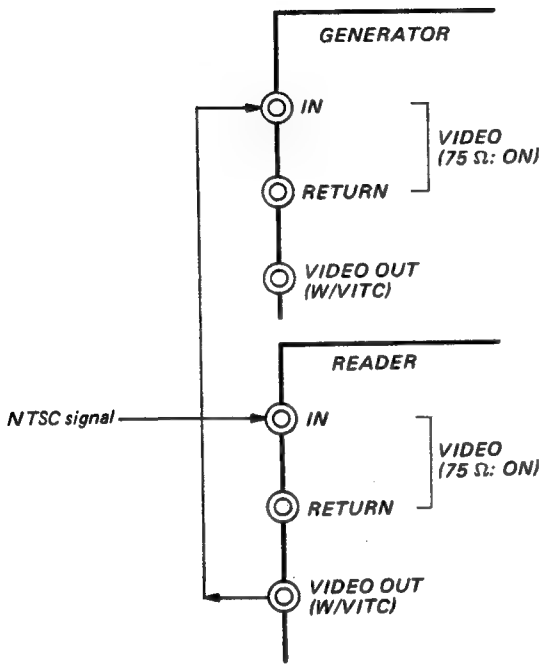


4-4-8. VITC Input Slice Level (GENERATOR) Adjustment

VIDEO Board; No. 1-587-451-11

Preparation; Connection:

BVG-1000



Front Panel
- GENERATOR/READER switch; GENERATOR
- SOURCE SELECT switch; EXT CODE
- REF select switch; VIDEO
- VITC THRU/ON/OFF switch; ON

Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

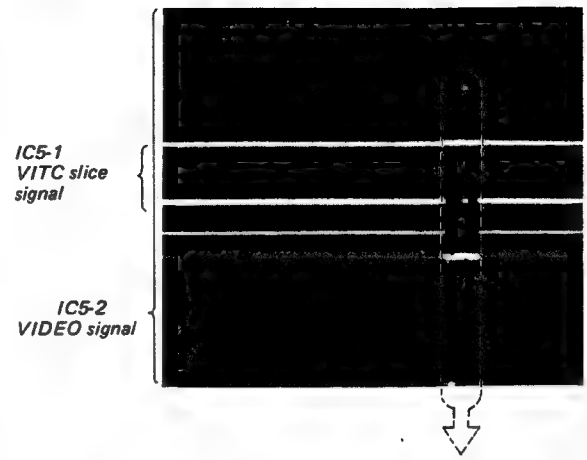
Equipment; Oscilloscope
- ALT mode
- INPUT: DC mode
- EXT TRIG: IC-B2, pin 6/VIDEO board

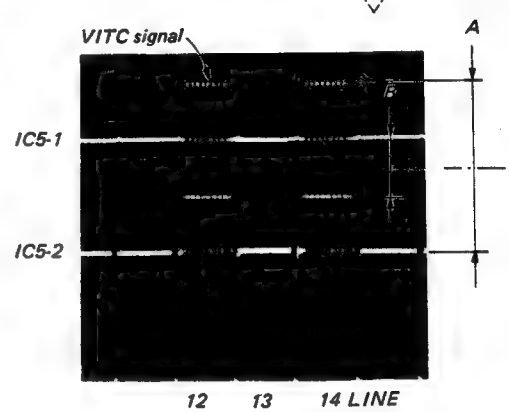
Spec. and Adj.;

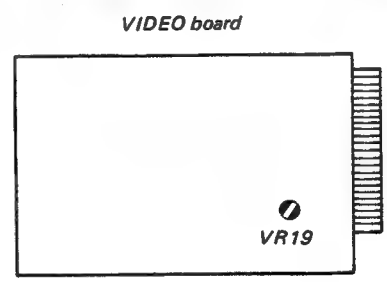
Step 1. Set the scope CH-1 and CH-2 VERT GAIN to 0.05 V/DIV.

Step 2. Set the scope INPUT of both CH-1 and CH-2 to GND mode and adjust the scope GND trace line to the bottom of scope scale.
Set then the both INPUT mode to the DC mode.

Step 3. VIDEO board
⊘VR19
Adjust so that the center of the VITC slice level "B" (IC5-1) and the center of the VITC signal level "A" (IC5-2) are on the same line on scope.



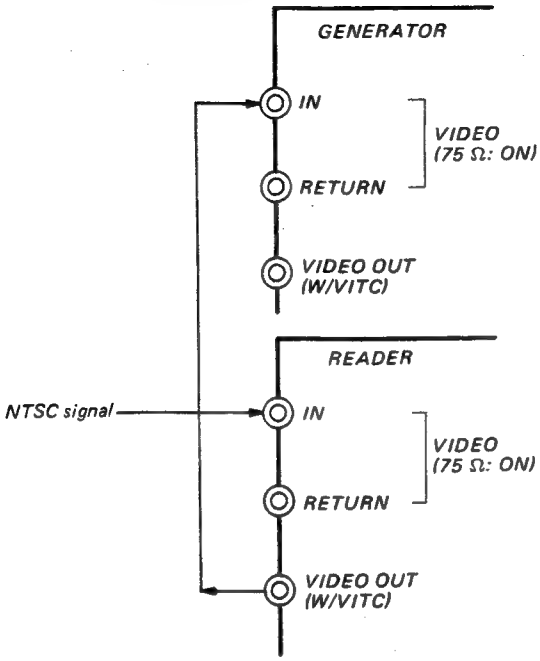




VIDEO Board; No. 1-587-451-12

Preparation; Connection:

BVG-1000



Front Panel
GENERATOR/READER switch; GENERATOR
SOURCE SELECT switch; EXT CODE
REF select switch; VIDEO
VITC THRU/ON/OFF switch; ON

Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

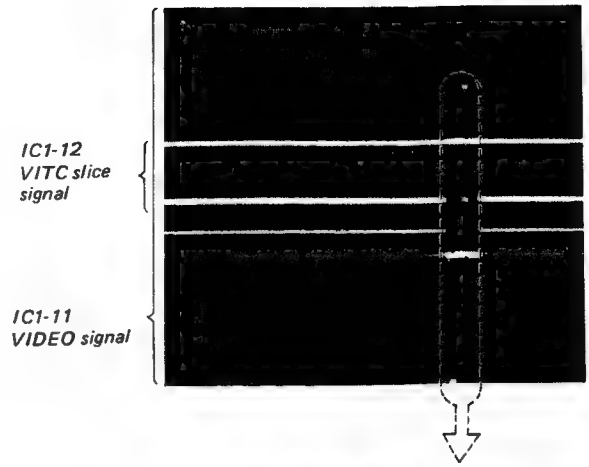
Equipment; Oscilloscope
ALT mode
INPUT: DC mode
EXT TRIG: IC-A2, pin 6/VIDEO board

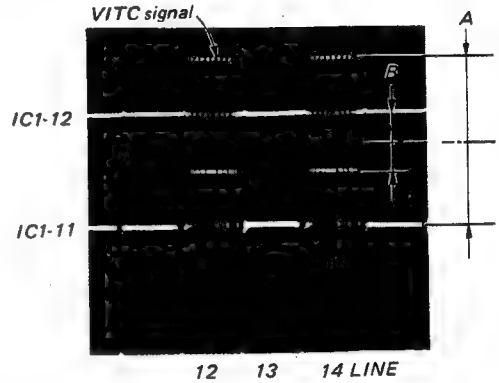
Spec. and Adj.;

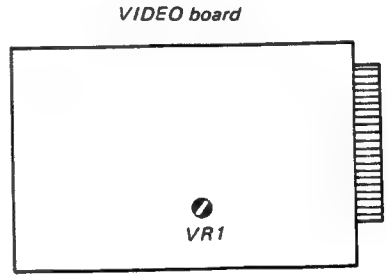
Step 1. Set the scope CH-1 and CH-2 VERT GAIN to 0.05 V/DIV.

Step 2. Set the scope INPUT of both CH-1 and CH-2 to GND mode and adjust the scope GND trace line to the bottom of scope scale.
Set then the both INPUT mode of the DC mode.

Step 3. VIDEO board
◐VR1
Adjust so that the center of the VITC slice level "B" (IC1-12), and the center of the VITC signal level "A" (IC1-11) are on the same line on scope.





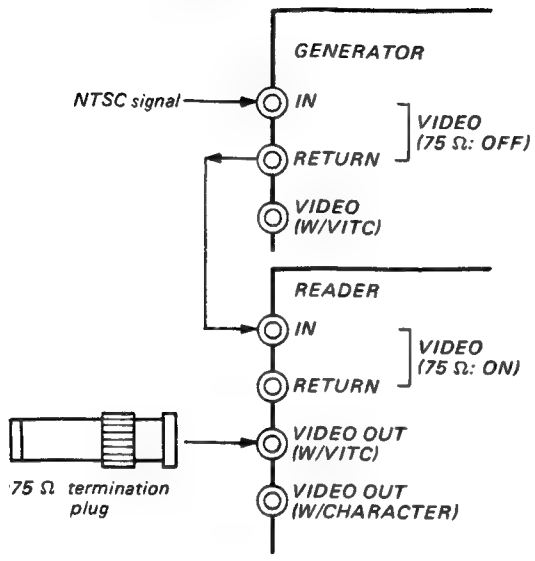


4-4-11. VITC Output Level (READER; W/VITC) Adjustment

VIDEO Board; No. 1-587-451-11

Preparation; Connection:

BVG-1000

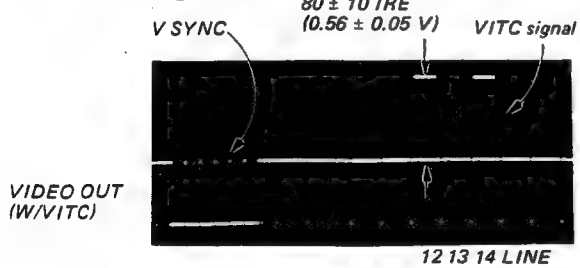


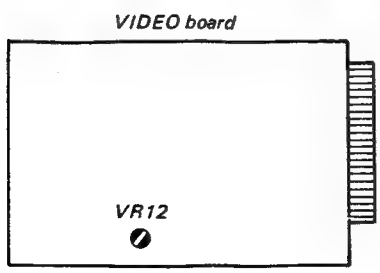
Front Panel
REF select switch: VIDEO
VITC THRU/ON/OFF switch: ON

Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

Equipment; Oscilloscope
EXT TRIG: IC-B2, pin 6/VIDEO board

Spec. and Adj.; VIDEO board
VR12

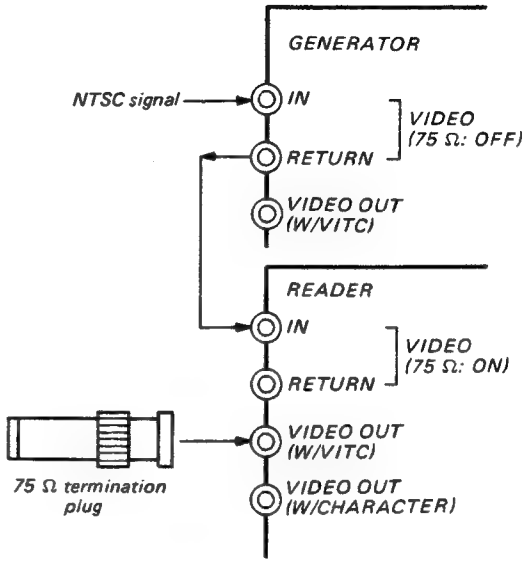




VIDEO Board; No. 1-587-451-12

Preparation; Connection:

BVG-1000

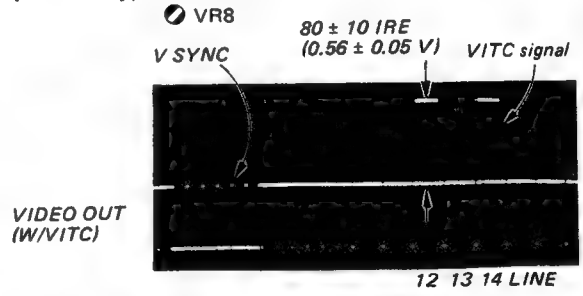


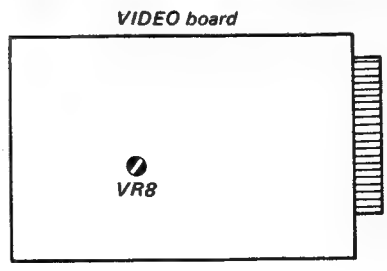
Front Panel
REF select switch: VIDEO
VITC THRU/ON/OFF switch: ON

Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

Equipment; Oscilloscope
EXT TRIG: IC-A2, pin 6/VIDEO board

Spec. and Adj.; VIDEO board
VR8



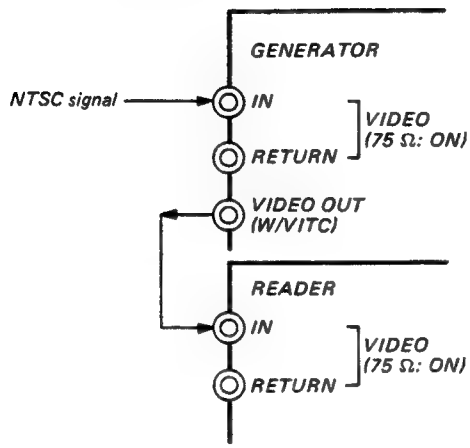


4-4-12. VITC Input Slice Level (READER) Adjustment

VIDEO Board; No. 1-587-451-11

Preparation; Connection:

BVG-1000



Front Panel
- GENERATOR/READER switch: GENERATOR
- SOURCE SELECT switch: REF
- REF select switch: VIDEO
- VITC ON/OFF switch: ON

Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

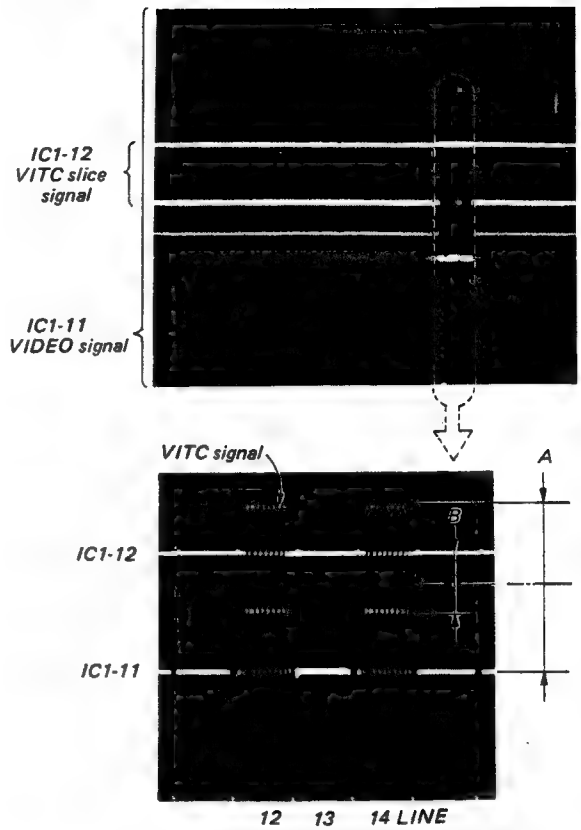
Equipment; Oscilloscope
- ALT mode
- INPUT: DC mode
- EXT TRIG: IC-B2, pin 6/VIDEO board

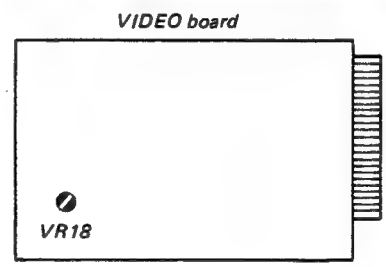
Spec. and Adj.;

Step 1. Set the scope CH-1 and CH-2 VERT GAIN to 0.05 V/DIV.

Step 2. Set the scope INPUT of both CH-1 and CH-2 to GND mode and adjust the scope GND trace line to the bottom of scope scale.
Set then the both INPUT mode to the DC mode.

Step 3. VIDEO board
⊘VR18
Adjust so that the center of the VITC slice level "B" (IC1-12), and the center of the VITC signal level "A" (IC1-11) are on the same line on scope.

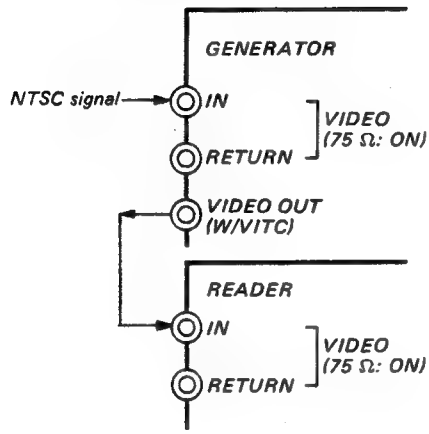




VIDEO Board; No. 1-587-451-12

Preparation; Connection:

BVG-1000



Front Panel
GENERTOR/READER switch: GENERATOR
SOURCE SELECT switch: REF
REF select switch: VIDEO
VITC ON/OFF switch: ON

Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

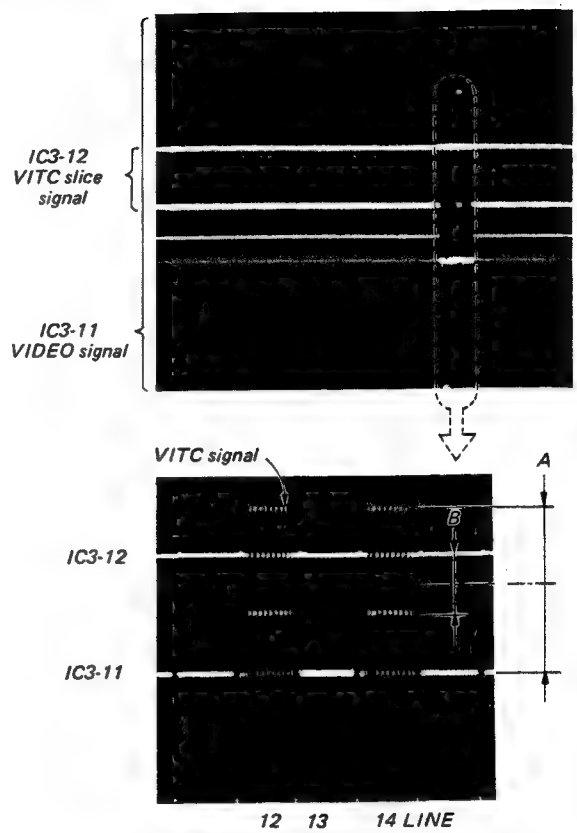
Equipment; Oscilloscope
ALT mode
INPUT: DC mode
EXT TRIG: IC-A2, pin 6/VIDEO board

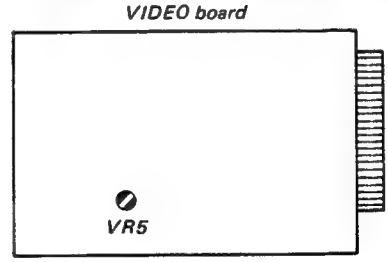
Spec. and Adj.;

Step 1. Set the scope CH-1 and CH-2 VERT GAIN to 0.05 V/DIV.

Step 2. Set the scope INPUT of both CH-1 and CH-2 to GND mode and adjust the scope GND trace line to the bottom of scope scale.
Set then the both INPUT mode of the DC mode.

Step 3. VIDEO board
⊘ VR5
Adjust so that the center of the VITC slice level "B" (IC3-12), and the center of the VITC signal level "A" (IC3-11) are on the same line on scope.

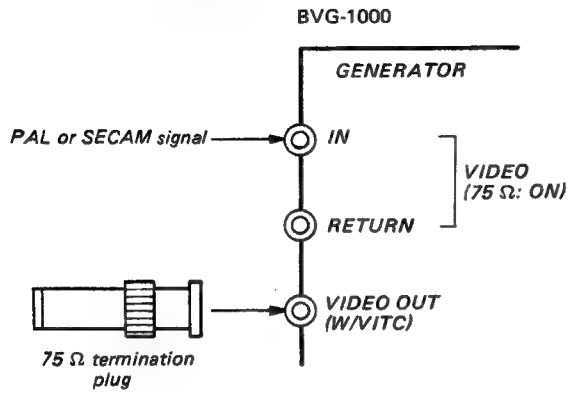




4-4-7. VITC Output Level (GENERATOR) Adjustment

VIDEO Board; No. 1-587-451-11

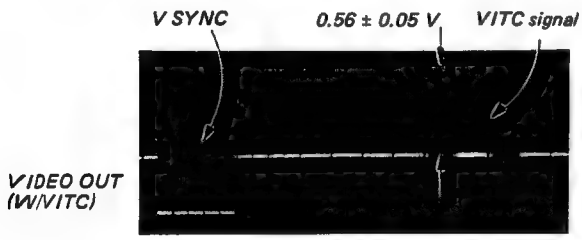
Preparation; Connection

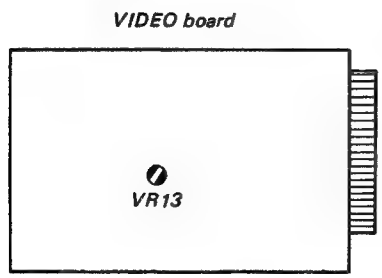


Front Panel
REF select switch: VIDEO
VITC ON/OFF switch: ON
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

Equipment; Oscilloscope
EXT TRIG: IC-B2, pin 6/VIDEO board

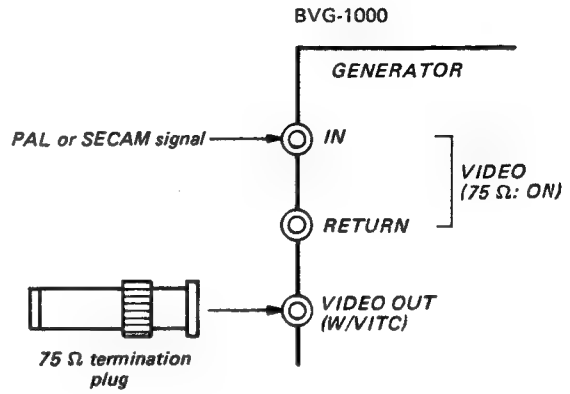
Spec. and Adj.; VIDEO board
VR13





VIDEO Board; No. 1-587-451-12

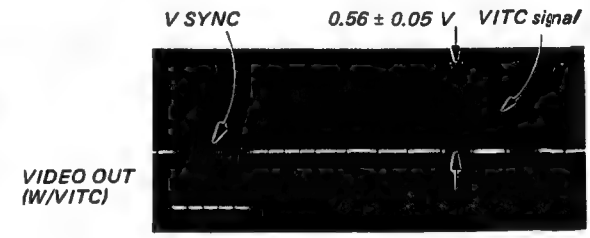
Preparation; Connection:

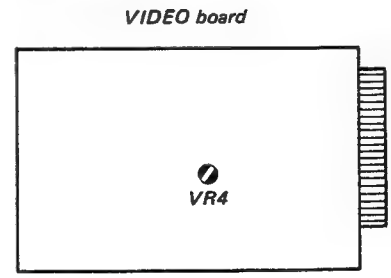


Front Panel
REF select switch: VIDEO
VITC ON/OFF switch: ON
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

Equipment; Oscilloscope
EXT TRIG: IC-A2, pin 6/VIDEO board

Spec. and Adj.; VIDEO board
VR4

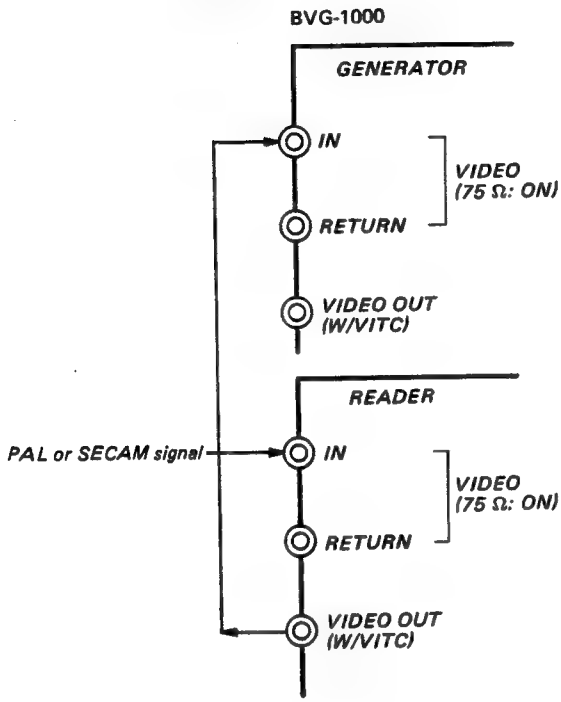




4-4-8. VITC Input Slice Level (GENERATOR) Adjustment

VIDEO Board; No. 1-587-451-11

Preparation; Connection:



Front Panel
GENERATOR/READER switch; GENERATOR
SOURCE SELECT switch; EXT CODE
REF select switch; VIDEO
VITC THRU/ON/OFF switch; ON

Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

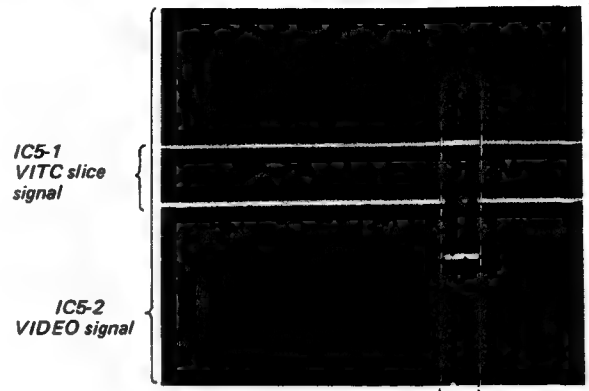
Equipment; Oscilloscope
ALT mode
INPUT: DC mode
EXT TRIG: IC-B2, pin 6/VIDEO board

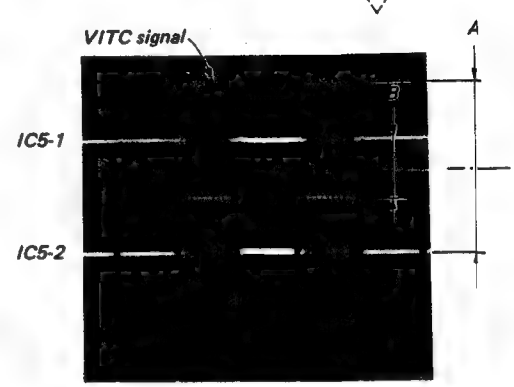
Spec. and Adj.;

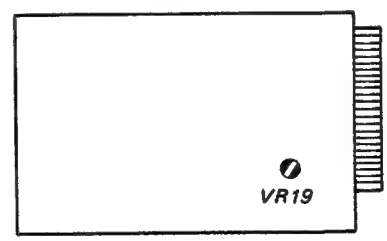
Step 1. Set the scope CH-1 and CH-2 VERT GAIN to 0.05 V/DIV.

Step 2. Set the scope INPUT of both CH-1 and CH-2 to GND mode and adjust the scope GND trace line to the bottom of scope scale.
Set then the both INPUT mode to the DC mode.

Step 3. VIDEO board
⊘VR19
Adjust so that the center of the VITC slice level "B" (IC5-1) and the center of the VITC signal level "A" (IC5-2) are on the same line on scope.

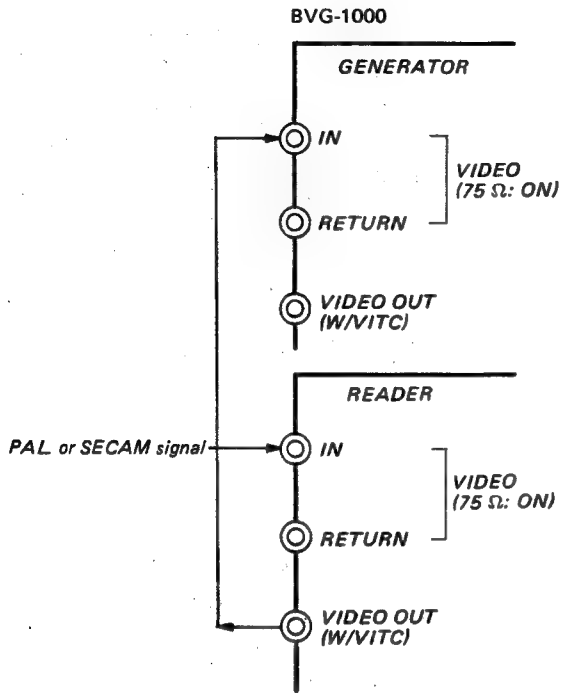






VIDEO Board; No. 1-587-451-12

Preparation; Connection:



Front Panel
GENERATOR/READER switch; GENERATOR
SOURCE SELECT switch; EXT CODE
REF select switch; VIDEO
VITC THRU/ON/OFF switch; ON
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

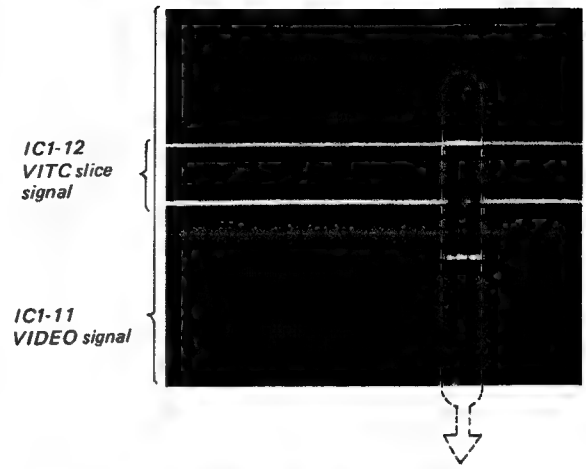
Equipment; Oscilloscope
ALT mode
INPUT: DC mode
EXT TRIG: IC-A2, pin 6/VIDEO board

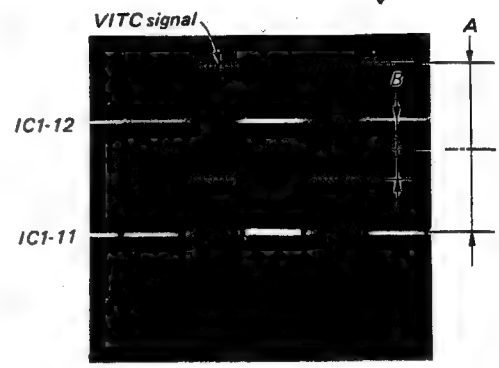
Spec. and Adj.;

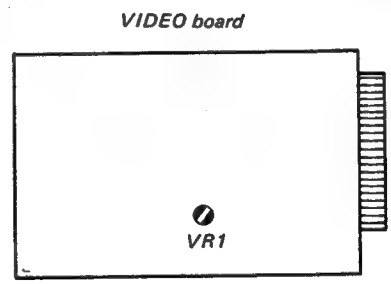
Step 1. Set the scope CH-1 and CH-2 VERT GAIN to 0.05 V/DIV.

Step 2. Set the scope INPUT of both CH-1 and CH-2 to GND mode and adjust the scope GND trace line to the bottom of scope scale.
Set then the both INPUT mode of the DC mode.

Step 3. VIDEO board
◐VR1
Adjust so that the center of the VITC slice level "B" (IC1-12), and the center of the VITC signal level "A" (IC1-11) are on the same line on scope.



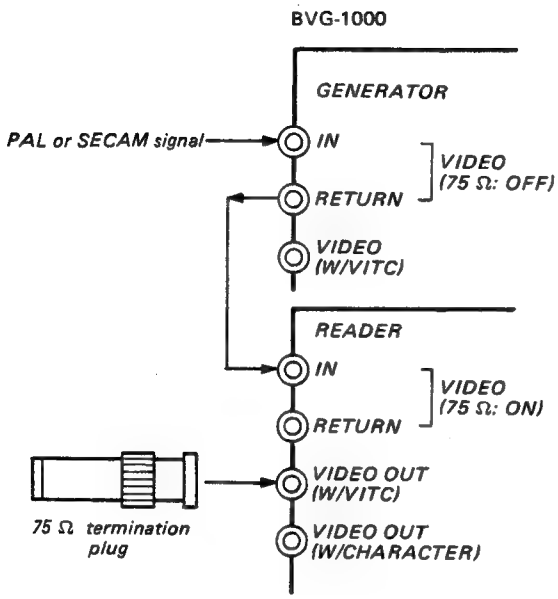




4-4-11. VITC Output Level (READER; W/VITC) Adjustment

VIDEO Board; No. 1-587-451-11

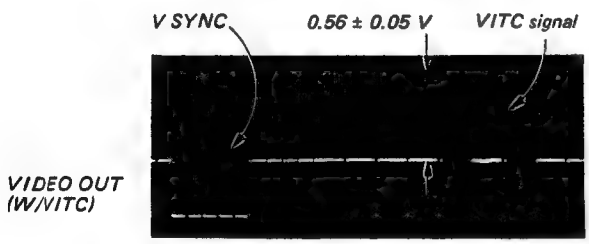
Preparation; Connection:

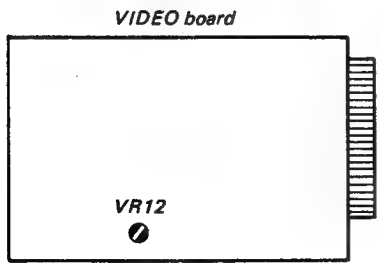


Front Panel
REF select switch: VIDEO
VITC THRU/ON/OFF switch: ON
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

Equipment; Oscilloscope
EXT TRIG: IC-B2, pin 6/VIDEO board

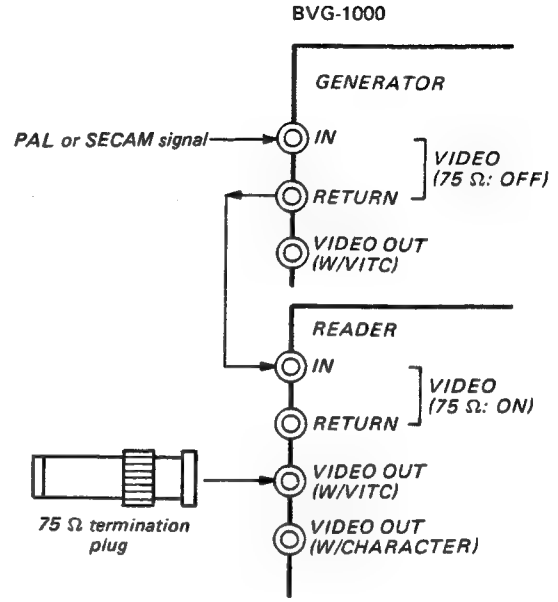
Spec. and Adj.; VIDEO board
VR12





VIDEO Board; No. 1-587-451-12

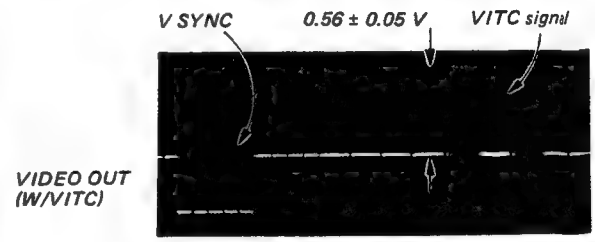
Preparation; Connection:

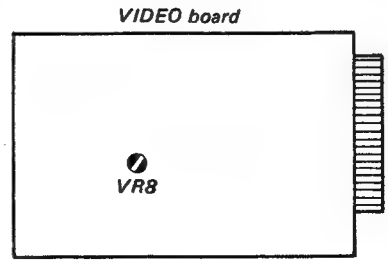


Front Panel
REF select switch: VIDEO
VITC THRU/ON/OFF switch: ON
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

Equipment; Oscilloscope
EXT TRIG: IC-A2, pin 6/VIDEO board

Spec. and Adj.; VIDEO board
VR8

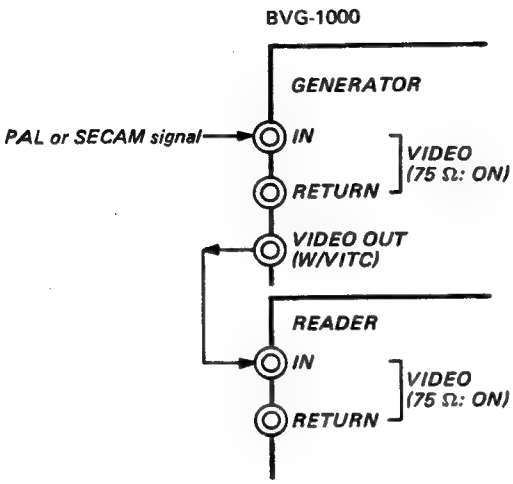




4-4-12. VITC Input Slice Level (READER) Adjustment

VIDEO Board; No. 1-587-451-11

Preparation; Connection:



Front Panel
GENERATOR/READER switch: GENERATOR
SOURCE SELECT switch: REF
REF select switch: VIDEO
VITC ON/OFF switch: ON
Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

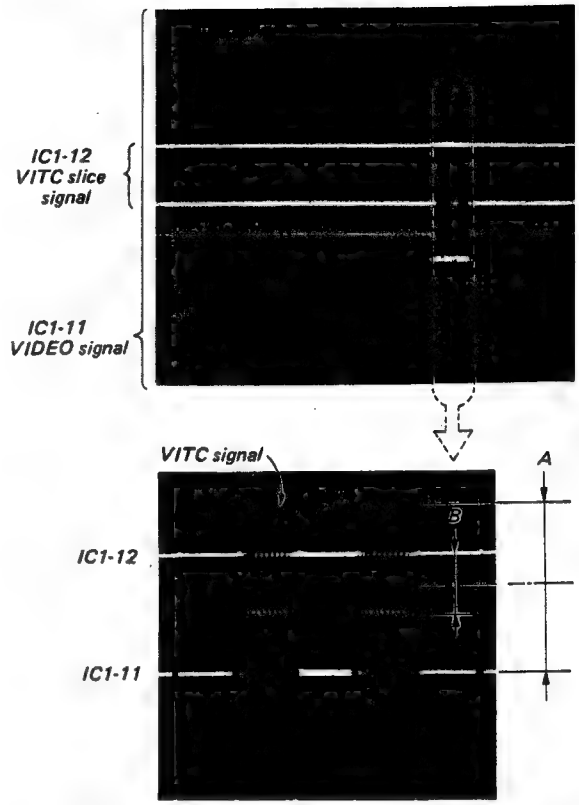
Equipment; Oscilloscope
ALT mode
INPUT: DC mode
EXT TRIG: IC-B2, pin 6/VIDEO board

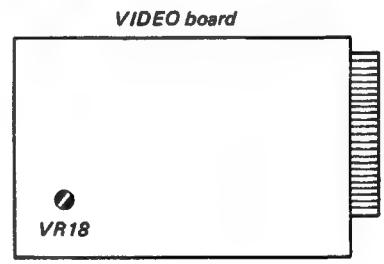
Spec. and Adj.;

Step 1. Set the scope CH-1 and CH-2 VERT GAIN to 0.05 V/DIV.

Step 2. Set the scope INPUT of both CH-1 and CH-2 to GND mode and adjust the scope GND trace line to the bottom of scope scale.
Set then the both INPUT mode to the DC mode.

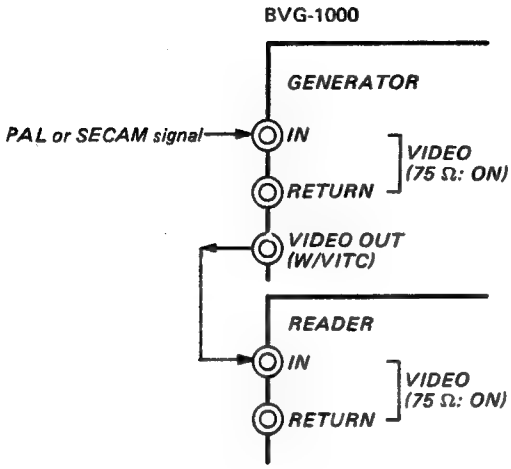
Step 3. VIDEO board
⊘VR18
Adjust so that the center of the VITC slice level "B" (IC1-12), and the center of the VITC signal level "A" (IC1-11) are on the same line on scope.





VIDEO Board; No. 1-587-451-12

Preparation; Connection:



Front Panel
GENERTOR/READER switch: GENERATOR
SOURCE SELECT switch: REF
REF select switch: VIDEO
VITC ON/OFF switch: ON

Same as Sec. 4-4-1, except Connection and Front Panel setting as shown above.

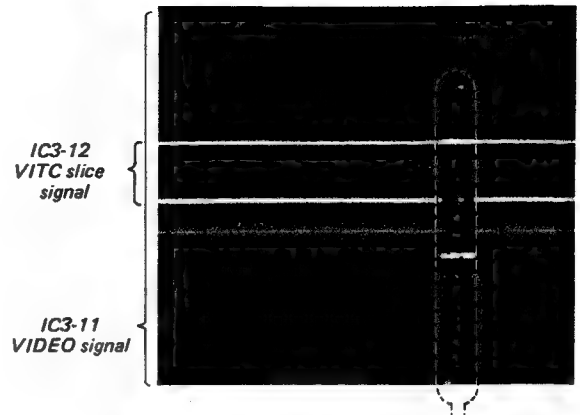
Equipment; Oscilloscope
ALT mode
INPUT: DC mode
EXT TRIG: IC-A2, pin 6/VIDEO board

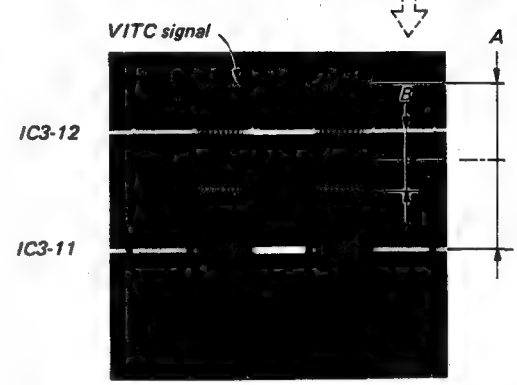
Spec. and Adj.;

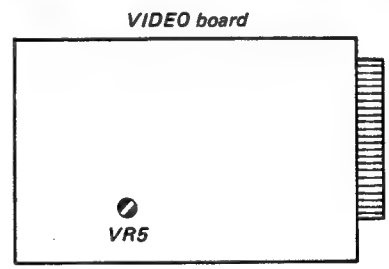
Step 1. Set the scope CH-1 and CH-2 VERT GAIN to 0.05 V/DIV.

Step 2. Set the scope INPUT of both CH-1 and CH-2 to GND mode and adjust the scope GND trace line to the bottom of scope scale.
Set then the both INPUT mode of the DC mode.

Step 3. VIDEO board
⊘ VR5
Adjust so that the center of the VITC slice level "B" (IC3-12), and the center of the VITC signal level "A" (IC3-11) are on the same line on scope.







SONY®

TIME CODE GENERATOR/READER

BVG-1000

SUPPLEMENT-5

EFFECTIVE SERIAL NUMBER

USA/CND #21201 and higher
Europe #20201 and higher

SUBJECT

Change Information

This supplement shows the technical changes applied to the BVG-1000 of Serial No. 21201 & UP (USA/CND) and Serial No. 20201 & UP (Europe).

Please apply these information to your owned manual (1st Edition to 1st Edition Revised 8) with Supplement-4 (Revised 1).

対象機番

JAPAN #20701以降

内容

変更情報

この追加版は20701号機以降のBVG-1000に実施された変更の情報です。

お手持のマニュアル(1st Edition～1st Edition Revised 7)にSupplement-4(Revised 1)と共に当追加版Supplement-5の内容を加えてお使い下さい。

OPERATION AND MAINTENANCE MANUAL

9-966-443-87

Sony Corporation

1981.9 0[illegible]6.1-4

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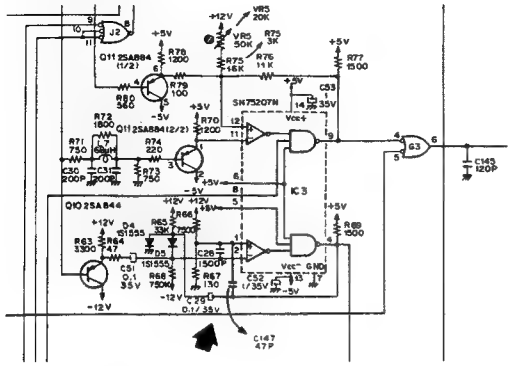
CIRCUIT CHANGE

VIDO board USA/CND # 21201 –
JAPAN # 20701 –
AEP # 20201 –

Supplement 4 -30/35

C147 ADD ⟶ 47PF



VIDO board USA/CND # 21401 –
JAPAN # 20901 –
AEP # 20401 –

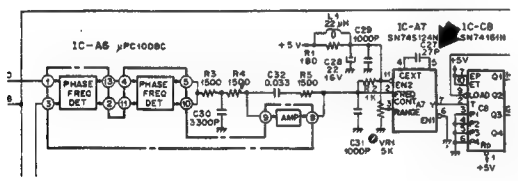
Supplement 4 -30/35

IC-D2
IC-H3 } SN74LS04N ⟶ SN74LS14N

GENR board USA/CND # 21201 –
JAPAN # 20701 –
AEP # 20201 –

Supplement 4 -31/35

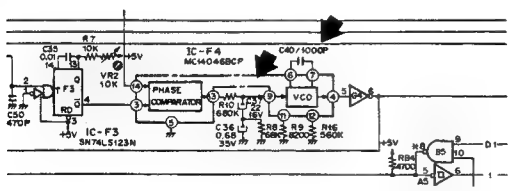
C27 27P ⟶ 15P



GENR board USA/CND # 21401 –
JAPAN # 20901 –
AEP # 20401 –

Supplement 4 -31/35

C37 22/16V ⟶ 6.8/35V
C40 1000PF ⟶ 1500PF



(GENR board, continued)

Supplement 4-31/35

IC-A3
IC-B3 } SN74LS04N ⟶ SN74LS14N
IC-H6

REDR board USA/CND # 21401 –
JAPAN # 20901 –
AEP # 20401 –

Supplement 4-34/35

IC-D3
IC-F4 } SN74LS04N ⟶ SN74LS14N
IC-K1

ADJUSTMENT CHANGE

Supplement 4-12/35

SUPPLEMENT-4

4-4. ADJUSTMENTS

~~After completing the modification, perform the following adjustments according to the procedure that is attached to this supplement.~~

~~改造後，当サプリメントに添付された調整要項に従って下記の調整を行なう。~~

~~4-4-7. VITC Output Level (GENERATOR) Adj.~~
~~4-4-8. VITC Input Slice Level (GENERATOR) Adj.~~
~~4-4-11. VITC Output Level (READER: W/VITC)~~
~~4-4-12. VITC Input Slice Level (READER)~~

After completing the modification, perform the following adjustments according to the sequence shown below.

Note: The adjustments marked by an asterisk are shown in the Supplement-4.

4-4-5. Video Output Level (GENERATOR) Adj.
4-4-6. VITC Insertion Portion Pedestal Level (GENERATOR) Adj.
* 4-4-7. VITC Output Level (GENERATOR) Adj.
4-4-9. Video Output Level (READER) Adj.
4-4-10. VITC Insertion Portion Pedestal Level (READER) Adj.
* 4-4-11. VITC Output Level Adj.
* 4-4-8. VITC Input Slice Level (GENERATOR) Adj.
* 4-4-12. VITC Input Slice Level (READER) Adj.

PARTS CHANGE

CONP board

P5-8 **C1001**, **C1002**, **C1006**, **C1007**: Correction (dropped)
→ 1-123-308-00 CAP, ELECT 220 10V

GENR board

P5-8 **C3027**: 1-107-102-00 CAP, MICA 5PF 50V
USA/CND; up to # 10060, J; up to # 10040
→ 1-107-071-00 CAP, MICA 27PF 50V
USA/CND; # 10061 –, J; # 10041 –,
AEP; # 10001 –
→ 1-107-206-00 CAP, MICA 15PF 500V
USA/CND; # 21201 –, J; # 20701 –,
AEP; # 20201 –

C3037: 1-131-373-00 CAP, TANT 22 10% 16V
→ 1-131-352-00 CAP, TANT 6.8 10% 35V

C3040: 1-108-227-00 CAP, MYLAR 0.001 10% 50V
→ 1-108-559-00 CAP, MYLAR 0.0015 5% 50V

C3050, **C3051**: Correction (dropped)
→ 1-102-114-00 CAP, CERAMIC 470PF 50V

P5-13 **IC3000-A3**, **IC3000-B3**, **IC3000-H6**: 8-759-900-04 IC SN74LS04N; TI
→ 8-759-900-14 IC SN74LS14N; TI

REDR board

P5-8 **C5052**: 1-102-973-00 CERAMIC 100PF 50V
→ DELETE

C5054: 1-102-824-00 CERAMIC 470PF 50V
→ DELETE

P5-14 **IC5000-D3**
P5-15 **IC5000-F4**, **IC5000-K1**: 8-759-900-04 IC SN74LS04N; TI
→ 8-759-900-14 IC SN74LS14N; TI

P5-21 **R5040**, **R5041**: 1-246-489-00 RES, CARBON 4.7K 5% 1/4W
→ 1-214-148-00 RES, METAL 4.7K 1% 1/4W

VIDO board

P5-9 **C7028**: 1-161-003-00 CAP, CERAMIC 0.0015 25V
→ 1-108-559-00 CAP, MYLAR 0.0015 5% 50V

P5-10 **C7110**: 1-102-074-00 CAP, CERAMIC 0.001 50V
→ 1-108-555-00 CAP, MYLAR 0.001 5% 50V

C7125, **C7128**: Correction (dropped)
→ 1-123-332-00 CAP, ELECT 47 25V

C7147: 1-107-092-00 CAP, MICA 200PF 5% 50V
→ 1-107-163-00 CAP, MICA 47PF 5% 500V

C7148: 1-107-092-00 CAP, MICA 200PF 5% 50V
→ DELETE

P5-17 **IC7000-D2**, **IC7000-H3**: 8-759-900-04 IC SN74LS04N; TI
→ 8-759-900-14 IC SN74LS14N; TI

P5-21 **R7068**: Correction (dropped)
→ 1-246-542-00 RES, CARBON 750K 5% 1/4W

SONY

TIME CODE GENERATOR/READER

BVG-1000

SUPPLEMENT-6

EFFECTIVE SERIAL NUMBER

USA/CND # 11001 and higher
Europe # 20201 and higher

SUBJECT

Change Information

This supplement shows the technical changes applied to the BVG-1000 of Serial No. 11001 & UP (USA/CND) and Serial No. 20201 & UP (Eureope).

Please apply these information to your owned manual (1st Edition to 1st Edition Revised 9) with Supplement-4 (Revised 1) and Supplement-5.

対象機番

JAPAN #10501 以降

内容

変更情報

この追加版は 10501 号機以降の BVG-1000 に実施された変更の情報です。

お手持のマニュアル (1st Edition～1st Edition Revised 8) に Supplement-4 (Revised 1), Supplement-5 と共に当追加版 Supplement-6 の内容を加えてお使い下さい。

OPERATION AND MAINTENANCE MANUAL

9-966-443-88

Sony Corporation

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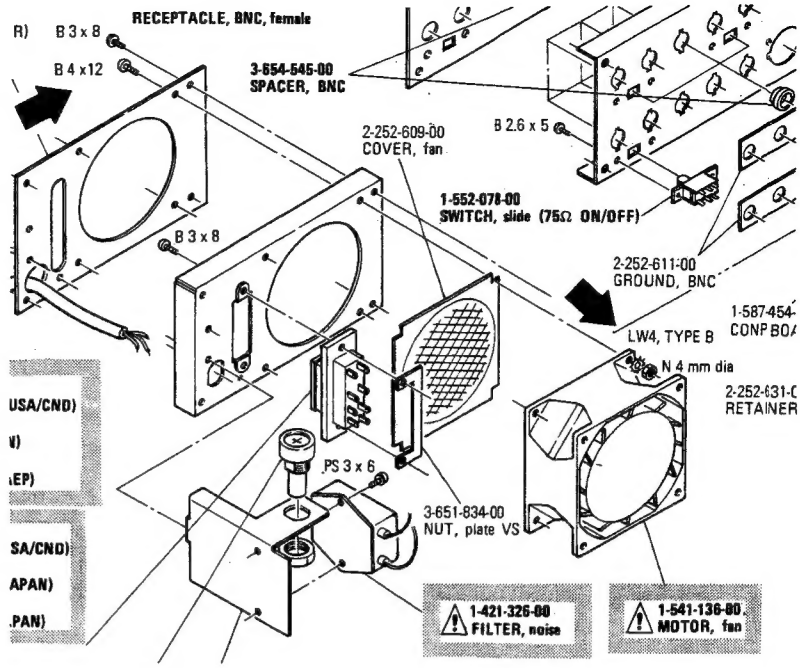
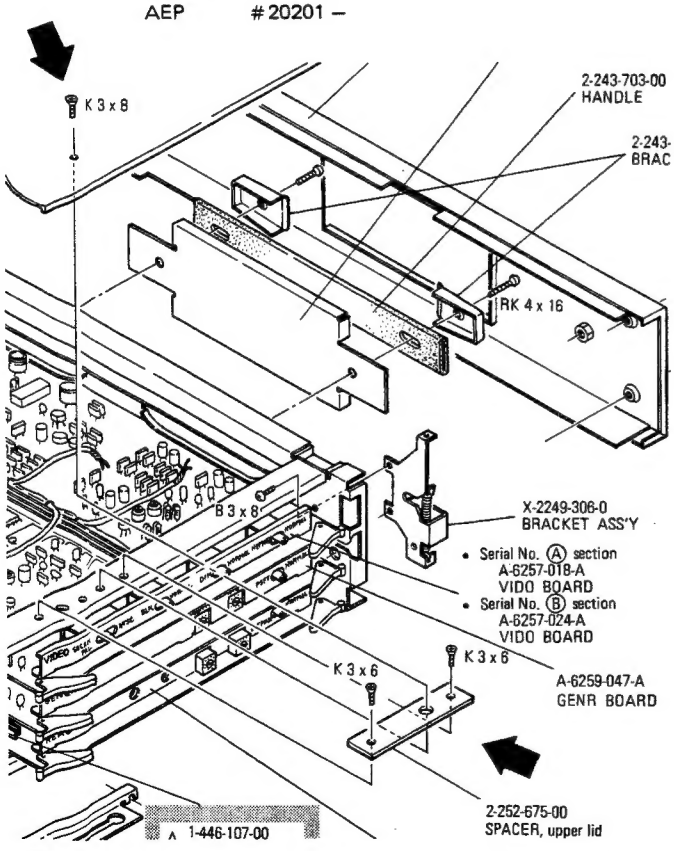
EXPLODED VIEW CHANGE

Chassis Block USA/CND # 11001 –
JAPAN # 10501 –
AEP # 20201 –

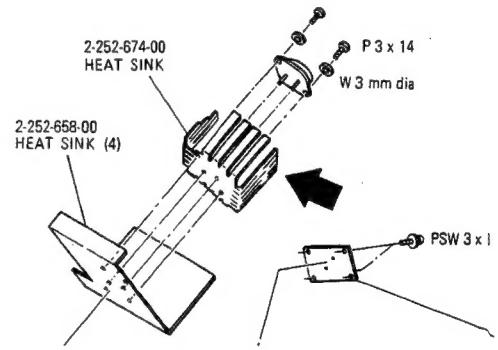
P5-3



P5-4 USA/CND # 21401 –
JAPAN # 21201 –
AEP # 20201 –



Heat Sink Block USA/CND # 21201 –
JAPAN # 20701 –
AEP # 20201 –



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